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WATER TREATMENT IN THE CANAL ZONE

Bacteria Multiply in Sedimentation Tanks and Rapid Sand Filters—Low Alkalinity of Water Causes Difficulty in Chemical Treatment and Corrosion of Iron Pipes—Preventing Pollution of Watershed.

The several settlements and United States government institutions in the Canal Zone along the Panama Canal, with the exception of three military posts on the west side of the Canal, are all supplied with water purified at three different plants. The largest of these is the Miraflores plant, that treated last year an average of 8,298,000 gallons per day. The Mt. Hope plant handled an average of 4,374,000 gallons per day; and the Agua Clara plant clarified 22,580 gallons per month. In the operation of these plants a number of very interesting problems were encountered and unusual conditions arose, which, although the extreme climatic conditions of the Canal Zone are largely responsible for them, may probably occur in less degree in plants in the southern part of the United States. Possibly the most interesting of these was the multiplication of bacteria in certain portions of the plant.

AERATION.

At the Mt. Hope plant the aeration basin is 60x66 feet and is equipped with 85 cone nozzles arranged in 5 batteries of 17 each. These nozzles are so adjusted that under ordinary operating conditions the raw water is discharged at an angle of 30° in thin sheets which break up into fine drops. The average diameter of the circle which would be formed by the discharge of one nozzle striking the floor would be 24 feet. The average loss of head due to the nozzle itself is 1.95 feet. With the nozzles adjusted for the maximum flow of water, the latter is discharged in the form of a sheet of varying thickness without any spraying. Under these conditions the average diameter of the circle which would be formed by the discharge of one nozzle striking the floor would be 10 feet, and the average loss of head due to the nozzle is ½ foot. The aeration basin of the Miraflores plant is 86x130 feet and contains 105 nozzles in 7 batteries of 15 each. These nozzles discharge at an angle of 20° in a thin sheet, which rises to an average height of about 15 feet. There is no aerating basin at the Agua Clara plant.

At the Mt. Hope plant the aeration reduces the temperature of the water about ½° C. It also decreases the amount of carbon dioxide and is quite efficient in removing disagreeable odors, an odor of hydrogen sulphide of a numerical value of 5 (Whipple's scale) being completely removed. The free carbonic acid during the last year of record varied in the raw water from zero to six parts per million, averaging about 1.7 parts, while that in the aerated water varied from zero to 5 parts, averaging about 0.4 part. The use of alum in filtration, which varied from 106 to 347 pounds per million gallons, in-

creased the final carbonic acid content to from 3 to 8 parts, averaging 4.8.

In the matter of dissolved oxygen the raw water has varied from 22.2 per cent saturation when drawn from the bottom of the reservoir to 119 per cent saturation when drawn from the surface. The effect of the aeration basin is to reduce the excessive amounts and increase the deficient ones, the 22.2 per cent saturation being increased to 90 per cent and the 119 per cent being decreased to 101 per cent. The water as finally leaving the plant ordinarily varied from 95 per cent to 110 per cent saturation.

At the Miraflores plant the free carbonic acid varied from 1.2 to 8.0 parts per million in the raw water and from 0.5 to 4.0 in the aerated water, the amount of reduction caused by aeration varying from 45 per cent to 61 per cent. The addition of free carbonic acid by the alum treatment caused the filtered effluent to run from 2.7 to 13.5 parts per million with a general average of about 5. The dissolved oxygen in the raw water varied from 40.7 per cent to 77.0 per cent saturation, with a mean of 64.4; while that of aerated water varied from 84.0 to 98.0, with a mean of 94.3. The odor has always been reduced by aeration, the filtered water never having been characterized by an odor of an intensity greater than one.

In each of the plants alum is added to the aerated water as it enters the mixing chambers on its way to sedimentation basins, there being three concrete mixing chambers in each plant.

SEDIMENTATION.

At the Mt. Hope plant there are three sedimentation basins lying parallel and cross-connected, with a total capacity of 2½ million gallons. Each basin is 171 feet long and the three basins have a combined width of 171 feet. The floor is sloped into valleys and summits, the depth at the valleys being 13 feet 6 inches, and at the summits 12 feet 3 inches. Each basin is divided into three compartments 56 feet 8 inches square by two pressure baffle walls, in each of which are four rectangular openings one foot wide by four feet long and placed 3½ feet below the water level. Extending in front of the openings in these baffle walls are concrete skimming troughs, which rise to within about a foot of the normal water level. In each of the three compartments there is a light baffle wall which extends from one side of the basin to within 6½ feet of the opposite side, the water passing around the end of the baffle in traversing the basin. By means of weirs in the inlet end of each of the two di-

vision walls, the three basins may be operated as one large basin. Also any one basin can be thrown out of service for cleaning by the closing of valves.

At the Miraflores plant also there are three sedimentation basins similarly arranged, but with a length of 300 feet and a combined width of the three basins of 125 feet, and with a depth at the floor valleys of 17.75 feet and at the summits of 16.5 feet. The openings in the pressure baffle walls at this plant are 1.5 feet wide and 6 feet long. Instead of the short baffle walls used at Mt. Hope, the light baffle walls at Miraflores extend entirely across the basin, but each contains four openings 6 feet wide and extending from within $2\frac{1}{2}$ feet of the top to within 3 feet of the bottom of the basin. The water remains in these sedimentation basins about 11 hours at the present average rate of operation.

The sedimentation basin at Agua Clara is 70.5 by 71 feet and 10.5 feet deep. It is divided into two basins by a pressure wall, each of which is further divided by a pressure baffle wall into two compartments, each of these baffle walls having three rectangular openings one foot wide by five feet long, with skimming troughs as in the other basins.

There were no unusual features of importance in the operation of the Miraflores sedimentation basin; but the experiences with bacteria at the Mt. Hope and Agua Clara basins have been very interesting. In the former the number of colonies of bacteria in the filtered water samples have exceeded those in the raw water, due partly to a multiplication of the bacteria in the water as it passed through the sedimentation basin, but still more to multiplication as it passed through the filter. In order to eliminate a multiplication of these harmless bacteria it was found necessary to drain and wash the first section of each basin once a week. Owing to the formation of a coarser floc than would occur in similar waters in the States (the temperature of the water being from 80° to 85° Fahr.), at least 75 per cent of the coloring matter and aluminum hydrate deposits in the sections first entered by the aerated and coagulated water. It is also necessary to drain and wash the entire basin every 30 days, as at the end of this time or earlier small cakes of sludge four to six inches thick are carried to the top of the water by the gas which has formed by septic action. The predominant odor during the cleaning of the basins is that of boiled cabbage. At times these cakes of sludge begin to float in less than 30 days after the previous cleanings and in that case if the basins are not immediately drained and cleaned the bacteria multiply rapidly. Owing to this necessity of frequent cleaning, the percentage of water used for this purpose during the fiscal year varied from 1.74 per cent to 6.46 per cent, averaging $4\frac{1}{2}$ per cent during the last four months, when the basins were cleaned regularly once a week.

During June, 1916, at the Mt. Hope plant, the average number of colonies on nutrient agar at 37.5° averaged 301 in the raw water and 169 in the settled water. This reduction in bacteria by sedimentation is low when we consider that 80 per cent to 95 per cent reduction is obtained in many basins in the United States, but the experience at Agua Clara was much more remarkable. For 13 weeks ending June 30, 1916, the average number of bacteria in the raw water varied from 238 to 881, while the number in the settled water leaving the basin varied from 279 to 1,620, these being daily counts. That is, there was in some cases an increase of 300 per cent in the bacterial content of the water by passing it through the sedimentation basin. Each of the basins is drained and washed each week, but even this did not eliminate the multiplication. In general, the bacteria started to increase the first day after the basins were cleaned and by

the second day the number had increased to 1,500 or more per c. c. and continued at about this number throughout the remainder of the week. Unfortunately, the gates between the two basins were not perfectly tight and it was impossible to prevent water leaking through from the basin in use to the one being cleaned, and it was impracticable to shut down the entire plant once a week so as to clean both basins at once; which condition undoubtedly resulted in a seeding of the clean basin with these bacteria. On two occasions copper sulphate was applied at the rate of 4 pounds per million gallons to the reservoir from which the water was drawn, with the idea that the reduction of algae caused by this would result in a considerable increase in bacteria, and that these bacteria would possibly overcome the species which were multiplying in the sedimentation basins. To a certain extent this result was obtained; but shortly after, the multiplication of the sedimentation basin bacteria began again, and up to the time of the writing of the report no method of eliminating them from the basins had been discovered, but the problem was being studied. In the Agua Clara plant from 4.8 per cent to 8.58 per cent of the purified water was wasted in cleaning the basins, the average for the year being 6.54 per cent.

FILTRATION.

In each of the plants the settled water passes to rapid sand filters. In the Mt. Hope plant there are 6 such filters measuring 27.5 by 18.66 feet, arranged in two rows of 3 units each, with the operating floor and pipe gallery between them. In the Agua Clara plant there are 4 filters measuring 17 feet square, ranged in two pairs with the operating floor and pipe gallery between; and in the Miraflores plant there are 14 filters in two rows, each filter measuring 19.75 by 21.5 feet. The Mt. Hope filters are operated at the rate of 106,000,000 gallons per acre per day, the Agua Clara filters, 102,000,000 gallons, and the Miraflores filters at the rate of 130,000,000 gallons.

The first two filters are provided with an under-drainage system of the Harrisburgh, Pa., type, composed of 2-inch galvanized pipes, 4 feet long, spaced 6 inches apart between centers, and perforated on the under sides with holes $\frac{7}{32}$ of an inch in diameter and spaced 3 inches apart. Each is provided with air for washing, brought through a 4-inch air line. In the Miraflores plant there is a reinforced concrete false bottom 12 inches thick, which forms the top of a pressure chamber 2 feet deep. In this false bottom are 1,677 vertical $\frac{3}{8}$ -inch brass feed pipes spaced 6 inches between centers, the ends of which pipes are bent 180° so that the wash water, instead of discharging upward, is discharged directly upon the floor. On the ends of these pipes are screwed brass strainers, there being a space of about $1\frac{1}{4}$ inches between the strainers and the top of the false floor. Each strainer is a slightly bucked circular plate $\frac{7}{8}$ of an inch in diameter, pierced with twenty-five $\frac{1}{16}$ -inch holes and swedged into a hexagonal base, which is screwed over the brass feed pipe.

In each of the three filters, the filtering material consists of 8 inches of coarse material retained on a 2-inch mesh, on top of which is 12 inches of material passing a 2-inch and retained on a $\frac{7}{16}$ -inch square mesh. In the Mt. Hope reservoir the next grade, between $\frac{1}{4}$ and $\frac{3}{8}$ of an inch in diameter, forms the top 2 inches, while in each of the other two there are 4 inches of material between $\frac{7}{16}$ and $\frac{3}{16}$ of an inch in diameter. This material is gravel obtained from the Chagres river. The top filtering sand in each case consists of 30 inches of beach sand having an effective size of .41 to .44 and uniformity coefficient of 1.7 to 1.8.

In the Mt. Hope and Agua Clara plants a low rate of

wash water is employed, air being relied upon for scouring the sand. With low velocity wash water, the use of air for this purpose was found to be essential to preventing the formation of an excessive number of mud balls; in addition to which the air freshens the sand and gravel by forcing out the odors which accumulate during a filter run. The water is then applied at the rate of 11.1 gallons per square foot of sand surface in the Mt. Hope plant, and 13 gallons in the Agua Clara. Air is applied for about 4 minutes on the average, the sand bed being lifted about $2\frac{1}{2}$ inches above the normal in the Mt. Hope and about 3 inches in the Agua Clara. Wash water is applied to the Miraflores filter at the rate of 6,400 gallons per minute, or 15 gallons per square foot of sand surface. In securing this, a pressure of about 12 pounds per square inch is exerted by the water under the false bottom. Under these conditions an excellent distribution of wash water results and the sand bed is raised $8\frac{1}{4}$ inches above its normal elevation. In three of the filters the strainers were not put on the ends of the feed pipes, and when these filters are washed with the same amount of water the pressure under the false bottom is only 6 pounds. The distribution of wash water is equally as good and the sand is lifted to the same height above the normal. At the end of a year of operation, the pressure chambers in filters equipped with and without strainers were examined, and it was found that no sand had worked down through the feed pipes in either case. From this experience it was considered that the strainers are unnecessary. During 14 months of operation in these filters, the average loss of sand was .82 of an inch depth, representing a total loss of 2.42 cubic feet for the 14 filters.

At the Mt. Hope reservoir the water was treated with liquid chloride and at the Miraflores reservoir with hypochloride of lime. In the latter the solution was pumped into the water under pressure, and calcium carbonate accumulated on the inside of the pumps quite rapidly, so that it was necessary to clean them and the discharge lines about every ten days, duplicate equipment permitting of this. On account of this trouble, a liquid chlorine plant was purchased and its installation was under way when the report was written.

The Mt. Hope water carries considerable vegetable matter and it seems impossible to prevent the accumulation of a certain amount of dirt in the filters on account of the low velocity of wash water. Ten months after this plant was put in operation, bacteria began multiplying in the filters and has continued ever since. An examination of mud balls showed 3,571 colonies per gram of dry sand contained therein, a number being gas formers. So long as it is impossible to prevent the accumulation of the mud balls it will probably be impossible to prevent the multiplication of these bacteria; and so long as they are present even in small numbers in the effluent used as wash water, they will be returned to the filters and act as starters of new colonies, even though the filter sand should be sterilized at intervals. One species found in the filter forms violet colonies on nutrient agar plates, but soon after the use of the liquid chlorine was begun and partially sterilized wash water became available this particular species practically disappeared. Undoubtedly because of the use of chlorine, the number of colonies

in the effluent from the filters had been reduced from an average of 779 to 303, and it is hoped that eventually the species responsible for the multiplication in the filters will be entirely eliminated by washing with sterile water.

The monthly averages of *B. coli* in the raw water at the Mt. Hope plant varied from 1,138 to 1,419 per liter, with a yearly average of 805, and those in the water distributed to the mains varied from zero to 193 per liter, averaging 33. These figures are based on presumptive tests with lactose peptone bile, incubated for 48 hours at 40°C ; tests showing less than 20 per cent gas being considered negative. The average filter runs per month at this plant varied from 12.3 to 29.3 hours, averaging 18.9 hours. The maximum filter run was 60.8 hours in October, and followed as a result of the treatment of the reservoir with copper sulphate at the rate of 5 pounds per million gallons. At Miraflores, the average filter runs varied from 21.7 to 50.6 hours, averaging 31.3.

CHEMICAL TREATMENT.

Perhaps the most interesting feature at the Agua Clara plant next to the experience with multiplication of bac-



BALBOA, ONE OF THE SETTLEMENTS RECEIVING WATER FROM THE MIRAFLORES PURIFICATION PLANT.

teria in the sedimentation basin was that connected with the use of alum. The alkalinity of the water supply ranged from 14 to 20 parts per million, and as the amount of alum necessary for the removal of color varied from 30 to 110 parts during the year, it was considered necessary to increase the alkalinity and decrease the amount of free carbonic acid in the filtered water by the addition of soda ash or lime. The former was begun in February, 1916. The use of settled water with zero alkalinity, and at times an alum acidity, caused a shortening of the filter runs to about 4 hours, a cementing together of the sand with the formation of hard spots in the filters, a marked corrosive action on service pipes, and—most important of all—a harmful physiological effect. At first the soda ash was added to the raw water prior to the application of alum, but this "fixed" the color and prevented its subsequent removal by alum, and the addition of the soda ash immediately after the application of alum was tried. This was an improvement, but the fixing of the color still continued, and in order to obtain an alkalinity of 10 parts it was necessary to raise the soda ash to 25 parts. On account of the high price of soda ash, lime was substituted near the end of February. After numerous laboratory experiments, it was decided to introduce a saturated solution of lime water into the partially decolorized and clarified raw water as it passed

from one compartment of the settling basin to the other. The practice finally adopted was to use about 380 to 406 pounds of alum and from 115 to 140 pounds of lime per million gallons. With this method of operation the color was reduced from a range of 65 to 110 in the raw water to from 3 to 7 in the filtered water. The free carbonic acid was reduced 30 per cent to 50 per cent, the alkalinity from about 20 to 14, the iron from 1.45 to 0.1, and the soap hardness was increased from 13.5 to 26.

The effect upon galvanized iron pipe of this water, containing 3.5 to 5.5 parts of free carbonic acid, is indicated by analyses made of water which had been allowed to stand in such a pipe in the laboratory over night. This water showed an iron content of 1 to 2 (an increase from 0.1 to 0.4), while after the water had been running 15 minutes the iron content fell to between .25 and .50. Undoubtedly all of the galvanizing had been removed from the pipe and the water was attacking the iron, and even after the water had run for 15 minutes, the iron content was larger than that of the filter effluent. The water forms rust spots on clothes in washing, stains porcelain fixtures and affects the taste of coffee, tea and cocoa.

WATER SHED PROTECTION.

In addition to filtering the water, effort is made to prevent pollution reaching the supplies previous to filtration. All of the water sheds are uninhabited and are policed to guard against trespass; but as the water sheds teem with wild animals (23 kinds are named), and the water with alligators, lizards, iguanas and other animals, more or less pollution reaches the water. Strains of the *B. coli* groups were found in the excrement of seven kinds of animals. During the latter part of the fiscal

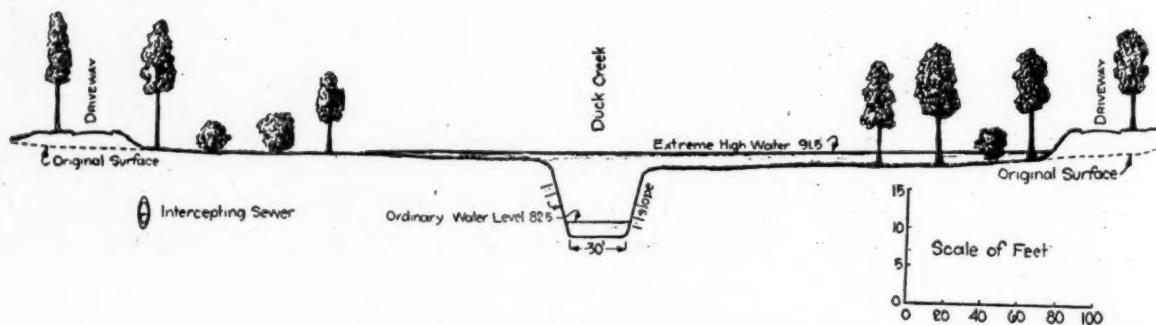
These water purification plants were in charge of George C. Bunker, physiologist; the Mt. Hope plant being in immediate charge of C. H. Spaulding and H. T. Campion, resident chemists; at the Agua Clara plant H. T. Campion and T. R. Kendall were resident chemists; while at the Miraflores plant E. J. Tucker, chief assistant to Mr. Bunker, was resident superintendent, and H. F. Schmidt was chemist and H. W. Nightingale was biologist.

DAVENPORT DRAINAGE DETAILS

Providing for Food Flow of Creek by Creating a Park Along the Banks—Storm Water Inlets for Steep Hills.

In a report made in 1916 to the city of Davenport, Ia., concerning the collecting and disposing of the sewage of that city by John W. Alvord, were several details somewhat out of the ordinary, two of which are described herewith because of their probable interest to other municipalities.

One was the handling of Duck creek, a typical meandering prairie stream having flat slopes and ordinarily low velocities of flow. During flood it overflows its banks and flows over a flood plain several hundred feet wide. In a plan of development for this area it was evident that attention must be given to the problem of handling the flood flows so that the elevation of the flood water may be lowered and the flood plain confined to a narrow belt along the creek.

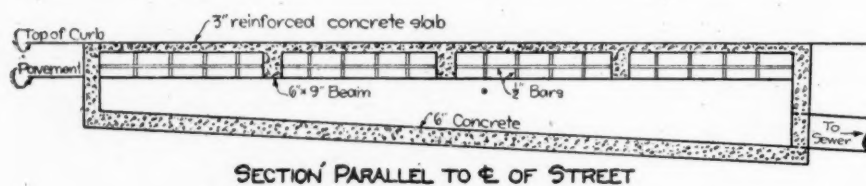


PROPOSED PARK ALONG DUCK CREEK.

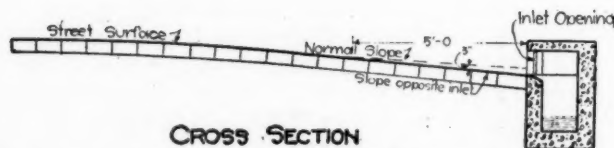
year, a beginning was made on clearing the trees from those portions of the water sheds nearest to the reservoirs and their feeders. This is regarded as an important matter, because the leaves that fall from the trees are the principal source of the coloring matter in the water; and it is also expected that the wild animals will be driven to the further portions of the water sheds by this clearing.

It was considered impracticable, for the present at least, to build a conduit to carry the flow, and the problem, therefore, reduces to how to carry the flood water with the least injury to property and with as little expense as possible. It was believed that the creek should be straightened, and in that way a steeper grade secured, but even with this increased capacity overflowing of the low land will occur, and it was suggested that the city purchase and dedicate a strip along the creek about 600 feet in width for park purposes. The illustration shows a typical cross-section of the improved creek. Some small expenditures would be necessary to maintain the creek channel in its new location, and perhaps some concrete retaining walls might be required, but their construction should not be started until experience demonstrates the necessity for them.

Mr. Alvord believed that if the city does not purchase this strip of land for park purposes the creek will never



SECTION PARALLEL TO C OF STREET



CROSS SECTION

SKETCH OF STORM WATER INLET FOR STEEP GRADES.

be straightened, and gradually the property owners will encroach upon the flood plain until an unusual freshet occurs with consequent loss of property and, perhaps, of life.

It would be practicable to build low dams in the creek, which would create lagoons, and with drives flanking the creek on either side a beautiful parkway would be reserved for public use. The land cannot be safely used for residential purposes, owing to its danger of flooding, and an expenditure of \$50,000 at the present time in this manner will enable the city of Davenport to start an outer boulevard and park system which will be a large asset to the future residents of this district.

In connection with the removal of storm water from the streets, Mr. Alvord proposed a form of inlet for a steep hill that gave a very long opening for withdrawing the water into the sewer connection, which, together with a 3-inch drop in the gutter grade, would probably be much more effective than the ordinary 20-inch to 36-inch opening.

DAYTON'S PROGRESS

Result of Three Years of Commission Manager Government—Death Rate Reduced—Garbage Collection and Street Repairing Cost Less.

Dayton, Ohio, believes, or at least the majority of its citizens seem to believe, that city-manager government has been a good thing for it, and they not only take a pride in the fact, but desire to see other cities profit by their experience. The latest reports relative to the results of commission-manager government give a number of facts and figures, from which we select the following as being of the most general interest:

The commission-manager form of government became effective January, 1914. The officials found that they had inherited an obligation of \$125,000 borrowed by previous administrations to meet operating expenses, but in the three years since then the city has been run on a cash basis and has paid off \$60,000 of that inherited indebtedness, and on January 1, 1917, had on hand a cash balance of \$49,291. Partly because of this, the taxes for the years 1914 and 1915 were \$42,000 and \$140,000, respectively, higher than the average for the three years previous, but in 1916 the taxes were lowered to \$25,000 less than such average. The government, however, claims that it has given the taxpayers more value per dollar for their money, even though the amount of taxes has increased. For that matter, however, it is doubtful whether the increase has been as great, considering the rate at which Dayton has been growing, as that in most other cities of the country, in all of which the tax rate has been increasing rapidly during the past few years.

During the three-year period the park and recreational space has been increased from one acre for each 5,948 persons to one acre for each 333 persons. During that time the death rate was reduced from 15.7 per thousand population to 13.0, while the infant mortality rate was reduced 27 per cent, and last year was 88 per thousand. In connection with the recreational work, 29 school gardens were worked by 1,400 children, and in addition to these, 958 vacant lots and 1,737 back yards were gardened; the total cost to the city being \$5,500 and the return about \$25,000 worth of products raised.

Prisoners devoted 30,000 work days last year to labor in the parks, on the streets and elsewhere. Many of them were paroled to work in factories during the day time, and their earnings from this work were taken over by the authorities and devoted to their dependent families

and to paying their outstanding obligations. The city has conducted a free legal aid bureau to take up the cause of indigents and secure justice for them in suits brought by loan sharks, installment houses and others. Through a free employment bureau 14,000 were placed in positions last year.

In the public works department, the work day was reduced to eight hours and wages advanced 25 per cent to 37½ per cent; in spite of which, twice as much work was done in 1916 at one-half the cost as under the previous form of government. Asphalt repairing that used to cost \$1.65 per square yard, last year cost 65 cents, street oiling has been reduced in cost 40 per cent, and garbage collection from \$2.60 a ton to \$1.60, the wagons covering nearly twice as many miles per day as formerly. The municipal garbage reduction plant yielded an income last year of \$10,000, paying a profit over and above all expenses and charges. The waterworks system has been made the subject of a comprehensive study and a plan has been prepared extending 25 years into the future. Although 63 per cent of the consumers pay less than \$5 per year for the service, the department has made the necessary sinking fund payments, paid off \$50,000 of inherited indebtedness, and last year paid into the city treasury a net profit of \$80,000. Large economies are claimed for the method of purchasing through a central purchasing bureau. The fire and police departments have been reorganized and increased in number of members and through this and through systematic fire prevention work the annual fire loss has been reduced \$120,000.

FREE TREES IN NEWBURGH.

Special attention has been given of late to the improvement of the appearance of the streets in Newburgh, N. Y., and many trees have been set out. Norway maples are used chiefly. Property owners may have trees planted in front of their property free of charge, upon request made to the municipal authorities.

CATCH BASIN CONSTRUCTION AND MAINTENANCE

When the Use of Catch Basins is Undesirable—Inlets Without Basins—Cost of Cleaning Catch Basins and Sewers.

(Continued from page 524.)

In recent years, the use of catch basins has been decreasing, and in its place inlets have been designed to furnish a direct connection between the street and the sewer, either with or without a water-seal trap.

It is interesting to note that there are no catch basins in Rochester, N. Y. Mr. Edwin A. Fisher, consulting engineer to the city, states that while they have had some difficulties due to the deposit of grit in the older sewers, and have found it necessary to adopt special ordinances for cleaning, on the whole they have had very little trouble from the lack of catch basins. The sewers, as a general rule, have very good grades, and the outlets to the river have free discharge.

Messrs. Rudolph Hering and Samuel M. Gray, reporting to the city of Baltimore in 1896 on sewerage and drainage, advised as follows:

"We are also of the opinion that the inlets should not be provided with catch basins to retain the silt or whatever may be washed into them."

Another statement, to be found in the report of the Metropolitan Sewerage Commission of New York for 1914, is as follows:

"Some sewerage systems are without catch basins, and

their elimination as a general procedure is much to be desired."

Similarly, in the report to the Commissioners of Sewerage of Louisville, by J. B. F. Breed and Harrison P. Eddy, 1913, there is the following statement:

"Careful consideration was given to the desirability of building inlets rather than catch basins, as had been the city's custom for many years. It was felt, however, that in this climate it was unwise to provide pools of water in which mosquitoes could breed, as is the case where catch basins are built, and further that under existing conditions the catch basins for the retention of detritus were not necessary in most cases. It was also found that it was already the practice of the Board of Public Works to build inlets instead of catch basins. The inlets built have been untrapped, and the experience thus far indicates that this type of inlets has given satisfaction."

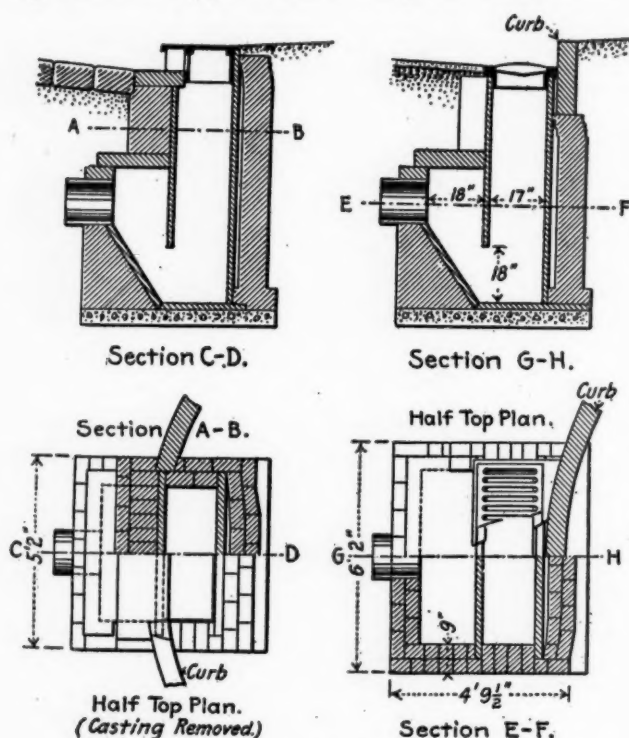


FIG. 10.—PHILADELPHIA, PA.

Other references of a similar nature including the above are given in greater detail in "American Sewerage Practice," Vol. I, pp. 520 to 522. Additional opinions might be cited to show that the trend of practice at the present time is toward the elimination of catch basins as far as practicable. There are locations, of course, where the conditions are such as to make it advisable to install catch basins to collect the sediment and prevent its being discharged into low-level sewers constructed on flat grades. In a modern sewerage system, however, where self-cleaning velocities in the sewers are maintained, and where the surfaces of the streets are paved and are kept in a fairly clean condition, it is believed that inlets will be found more satisfactory than catch basins. The cost of an inlet is materially less than that of a catch basin, and consequently it will be possible to provide better drainage for the same cost than as if catch basins were used throughout.

A number of standard types of inlets are shown in the accompanying figures.

The standards adopted by the borough of the Bronx, New York City, are shown in Fig. 4*. This figure shows five different types of inlets, one of which is trapped.

*For this and Fig. 7 see last week's issue.

With inlets of this type there is not so much tendency on the part of the street cleaners to push sweepings into the opening. In dry weather a considerable quantity of such sweepings may be pushed through the opening of the ordinary basin without the condition of the basin becoming apparent, but with the shallow inlet which has but little capacity for sediment, such a practice would soon be noticed and, if continued, the inlet would become clogged before a very material quantity of refuse had been so deposited.

The standard forms of inlet adopted for Philadelphia are shown in Fig. 10, one of which has an opening in the side of the curb and the other a grate in the gutter, through which the water is discharged into the sewer. Both of these inlets are trapped to prevent odors from the sewers reaching the street surface.

A design of inlet used by Metcalf & Eddy is shown in Fig. 7. The cost of this inlet is low, the construction simple and the area of grate opening large. The design shown provides for an 18-in. diameter grate. This can readily be modified as the conditions require, using either a larger or smaller grate for the particular purpose.

In 1913 and 1915 a number of such inlets were constructed at Hopedale, Mass. The cost in 1915 of the inlets complete, in earth excavation (excluding rock excavation), including pipe and cast-iron grating, was about \$46 for a 24-in. inlet and \$33 for an 18-in. inlet. This is a considerable saving over the cost of catch basins, which would probably have amounted to \$75 to \$100 each. The superintendent of streets of Hopedale has had no trouble with these inlets, except when children put sticks down through the grating. These form a dam over the outlet, and in time dirt accumulates back of them and the inlets fill up. Where this occurs, the obstruction can be easily removed. Inlets of a similar type have been in use on a side hill street for twenty-five years, with a catch basin at the foot of the hill. This basin is cleaned out periodically, but none of the inlets along the slope of the hill have required cleaning.

At Baltimore, following the advice of the consulting engineers, inlets were used in the improved sewerage of the city. The inlet is without a sump or collector and the flow passes directly from the street to the sewer or drain.

The standard form of inlet used at St. Louis was changed radically in 1915. The old form of inlet was very similar to that in use at Philadelphia. The new type of inlet allows the water to drop quickly from the gutter to the inlet, on account of the beveled edge given to the sill. This is of importance, especially on side hills, where there is a tendency for the water flowing in the gutter to rush past the inlet and surcharge inlets at the foot of the slope. It is intended to use the trapped type of inlet where the connection is to a sewer on a flat grade, and also where the inlets drain Telford streets on grades steep enough to allow the gravel to wash into the gutters. For all other locations the inlets without traps will be used.

The new designs for curb inlets at Pittsburgh, Pa., are of interest. The connection from the street opening to the drain is 9-in. or 12-in. vitrified clay pipe, depending on the type used. A contract for street reconstruction awarded during 1915 included the construction of 313 of these inlets at a contract price, complete in place including concrete and cement fillings, of \$20 per inlet. The inlets are located about 40 ft. apart along the curb line, and discharge into a 12-in. pipe laid about 5 ft. under the surface of the street. The collecting drains discharge into special trapped manholes leading to the

combined sewers. The manholes are trapped to prevent the escape of odors or steam in combined sewer.

Careful records are kept at Worcester, Mass., to show the cost of cleaning the catch basins. Some of these data, taken from the annual reports of the superintendent of sewers, are shown in Table 1. Each basin is cleaned by two men, one a "bottom" man who shovels the grit from the basin to the surface of the street and the other trims off the piles on the street surface and helps to load them into the cart. Several such gangs are sent to one district, under the supervision of a foreman. In this manner the work is done efficiently and at a reasonable expense.

In Table 1 it will be noted that the number of catch basins in use in the system has increased from year to year, approximately as the growth of the city and the sewerage system have increased. The basins being cleaned about twice per year on the average, some basins being cleaned only once a year, while others are cleaned more frequently, depending upon the location and the amount of sediment deposited in the basin. The average amount of material removed from each basin at each cleaning is in the vicinity of 2½ to 3 cu. yds. The average cost to remove the deposit from the basins, for the years 1905 to 1915, inclusive, was 73c. per cu. yd. The cost for the years 1914 and 1915 was 82c per cu. yd., this increase being due partly to an increased cost of labor and also to the increased length of haul required as the district becomes more thickly populated and the available dumping places near by become filled. From 1905 to 1911, inclusive, the minimum wage for labor for eight hours was \$1.85. After that date the minimum wage was \$2. The "bottom man" was paid a higher rate than the minimum, amounting to \$2.10 to \$2.25 per eight-hour day. The cost of teams was \$5 per day to 1914 and \$5.50 in 1915, including the driver. Formerly the driver assisted in loading his cart, but now all teams are hired and it is impossible to get drivers to shovel.

The catch basins now constructed in Worcester vary in size according to the requirements, but for the most part they are elliptical in plan, constructed of brick masonry, with interior dimensions of 4x6 ft., a maximum depth of 7 ft. below the surface of the gutter, with a depth below the invert of the trap of about 4 ft. The top is finished with a cast-iron D frame containing a removable grating. As a general rule the basins are built with a curb inlet. The average capacity of the basins below the trap is about 3 cu. yds. Various forms of traps have been used, but that used most frequently is the so-called Coleman trap, very similar in design to the trap used in the standard catch basins at Providence. This trap has in general proved satisfactory, although some trouble is experienced due to freezing of the water seal, especially on drains. The trap is also somewhat more liable to clog than some other designs. This happens especially when the basin becomes filled with sediment so that it overflows into the trap.

Table 2 shows the cost at Worcester, Mass., for thawing and freeing catch-basin traps from 1911 to 1915, inclusive. The unit costs of thawing and freeing traps per year per basin in service varies from 21c. to 47c.

TABLE 2.—Cost of Thawing and Freeing Catch Basin Traps.

Year Ending Nov. 30.	Number of Basins in Service	Cost of Thawing and Freeing Traps.	Cost Thawing and Freeing Traps per Basin.
1909	3,138	\$104	\$0.03
1910	3,257	459	0.14
1911	3,322	694	0.21
1912	3,413	1,603	0.47
1913	3,507	1,189	0.33
1914	3,563	1,022	0.29
1915	3,746	833	0.22

TABLE 3.—Sewer Cleaning in Worcester, Mass.

Year Ending Nov. 30.	Miles of Sewers in System.	Quantity of Deposit Removed in Cu. Yds.	Total Cost of Cleaning including Flushing.	Cost of Cleaning Sewers per Cu. Yd. of Deposit Removed including Flushing.
1905	177	1,484	\$5,754	\$3.88
1906	180	972	6,391	6.54
1907	183	665	6,478	9.74
1908	188	909*	5,306	5.84
1909	192	825*	6,007	7.28
1910	199	580*	4,535	7.82
1911	205	635	4,533	7.14
1912	213	724	4,665	6.45
1913	222	860*	4,711	5.50
1914	229	470*	4,511	9.60

* Includes sediment removed from regulators.

One of the strong arguments for constructing catch basins is that it is cheaper to clean the sediment from the catch basin than it is to remove it from the sewer. In this connection it is interesting to compare the cost of sewer cleaning at Worcester, Mass., with the cost of cleaning catch basins for corresponding years. These data are shown in Table 3. The unit costs of cleaning sewers based on the cubic yards of deposits removed for the years of 1906 to 1914, inclusive, varied from \$4.56 to \$8.26 per cu. yd. of deposit removed, exclusively of the cost of flushing sewers; and with flushing included, the cost of cleaning per cubic yard of deposit removed varied from \$5.50 to \$9.74.

For comparison with the above, the cost of removing the deposit from catch basins as per Table 1 varied from \$0.41 to \$0.83 per cu. yd. It is evident that if material is allowed to enter the gutter openings with the certainty of being deposited at some point in the drainage system, it is more economical to remove the deposit from catch basins than from the sewers.

If, on the other hand, the catch basins collect material which would have been carried along in the drainage system without being deposited, the basins become a source of expense that is not justified. Under such circumstances the basins should be replaced by inlets.

From the figures given in Table 1 it is assumed that the annual cost of cleaning a catch basin is \$2.00. In all probability the catch basin could be replaced by an inlet for an expense not exceeding \$50 to \$75. The annual expenditure of \$2.00, allowing interest at 4 per cent, represents an investment of \$50. Thus in one to two years' time would be saved the cost of replacing the catch basin with a suitable inlet involving practically no further charges for cleaning. The character of the street surface or pavement and the method of street

TABLE 1.—Data Regarding Cleaning of Catch Basins at Worcester, Mass. (Taken from Annual Reports of Supt. of Sewers.)

Year Ending Nov. 30.	Total No. of Catch Basins in System.	No. of Cleanings during the Year.	Av. Amt of Material Removed per Cleaning.†	Av. Amt. Material Removed per Basin per Year.	Cost Cleaning Deposit Removed.*	Cost Removing Material per Catch Basin per year.†	Minimum Wage for Labor — 8 Hours.
1905	2,748	4,652	3.93	7.5	\$0.41	...	\$1.85
1906	2,818	4,804	3.04	6.5	0.57	\$3.69	1.85
1907	2,902	5,053	2.72	5.1	0.81	2.48	1.85
1908	3,014	5,142	2.43	4.6	0.81	2.20	1.85
1909	3,138	6,094	2.45	4.0	0.80	1.94	1.85
1910	3,251	7,035	2.35	4.9	0.74‡	1.82	1.85
1911	3,322	6,783	2.56	5.1	0.69	1.65	1.85
1912	3,413	8,014	2.36	5.4	0.83	2.13	2.00
1913	3,507	5,522	2.55	4.1	0.80	1.89	2.00
1914	3,563	6,095	2.43	4.0	0.82	2.18	2.00
1915	3,746	0.82	1.95	2.00

* Includes cost of teams, labor removing refuse from basins, all inspection and looking after clogged and frozen traps.
 † Based on haul at rate of 1 1/5 cu. yd. per load to 1909 inclusive, after that date, 1 1/4 cu. yd. per load.
 ‡ Began using Watson dumping wagons in place of tip carts. Length of haul gradually increasing.

cleaning are two factors which strongly influence the question of the use of catch basins. Even where smooth, hard pavements such as wood block or asphalt are laid, and it would at first thought appear unnecessary to provide for catching grit, such provision is necessary at times because of the practice of sanding the pavements on rainy days to make them less slippery. Sand, stone and brick dust and other solid materials fall from passing carts in appreciable quantities where traffic is heavy. Such material will be washed into the drains during sudden showers in spite of all care in street cleaning.

Where paved streets are cleaned by flushing, a large quantity of detritus will be washed into the drains. There may be some question as to whether it is more economical to remove such material from the catch basins and drains after street flushing, or to sweep the streets and gather the detritus up from the gutters. Street sweepers seem to have acquired a reputation for pushing sweepings into basins and inlets, so that either method of cleaning may result in detritus being discharged into the drains, either by design, accident or otherwise.

One factor which has tended to produce unsatisfactory results, as regards the construction and maintenance of catch basins in many cities and towns, is the lack of co-operation between the various departments having in charge the design, construction and maintenance of the basins. If all of this work could be under the general supervision of one official, much better conditions might prevail. In many cities there is no adequate inspection of the basins and no regularity or system of cleaning. Oftentimes such basins are worse than useless, as they become filled, create objectionable odors and permit a large quantity of material to be discharged into the sewers in time of storm.

In the opinion of the writer, the results of the discussion may be summarized as follows:

1. Where combined sewers or drains are laid on very flat grades, not providing self-cleaning velocities, catch basins are useful to catch detritus in order that it may be removed more economically than from the sewers or drains.
2. A considerable saving in the cost of cleaning catch basins can be effected by the use of a suitable motor-truck equipment.
3. Of the two examples of motor-truck apparatus described, that developed by Mr. Carpenter appears to meet the conditions in New England cities where the Otterson machine failed, although successful in the West.
4. Where self-cleaning velocities can be obtained in

the drainage system, from the surface connections through to the point of discharge, inlets without traps should be built in preference to catch basins, both for economy and better service.

It may be more economical to construct a single catch basin in the main drain at the head of a section laid on a very flat grade rather than to build catch basins for a large number of surface connections.

5. Oil should be applied to the water in catch basins, to prevent the breeding of mosquitoes.

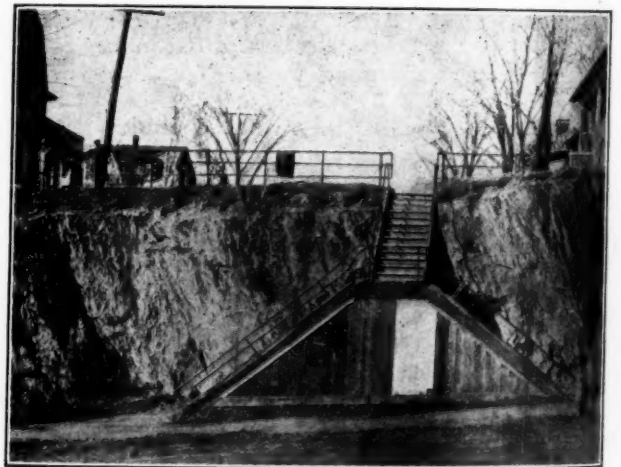
6. Catch basins should be regularly inspected and should be cleaned after each severe storm if necessary.

7. Catch basins should be built only where necessary, because of special conditions, and not as a matter of custom, as appears to be the practice in some cities.

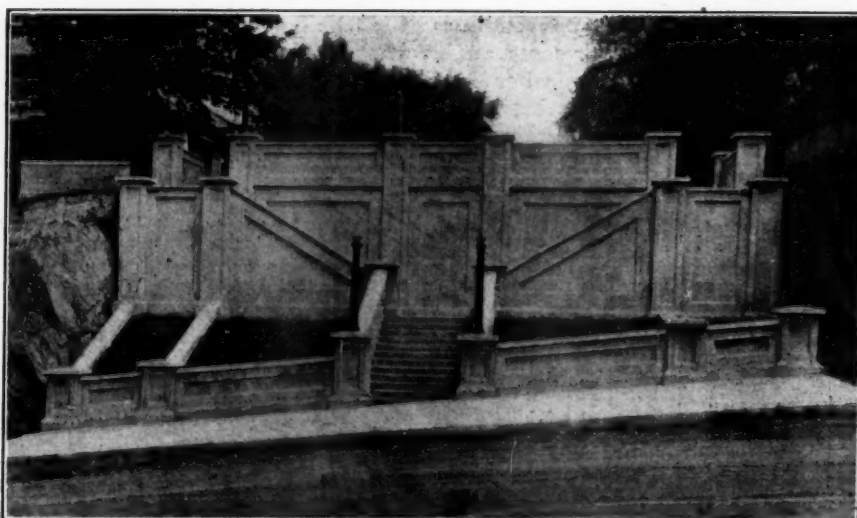
8. Unless catch basins are actually catching grit, which would otherwise be deposited in the sewer or drain, they should be replaced by inlets.

PUBLIC STAIRWAY IN TROY.

At the point where People's avenue, Troy, N. Y., crosses Twelfth street it was graded by making a rock cut 18 to 25 feet deep, leaving the latter street higher than the former by this amount. A flight of wooden steps was originally provided to enable pedestrians to pass from one street to the other. Numerous complaints had been received from the residents of the neighborhood regarding the unsightliness and dangerous condition of these, and finally the design shown in the accompanying photograph was decided upon and the steps were built in



OLD WOODEN STEPS ON PEOPLE'S AVENUE.



NEW CONCRETE STEPS ON PEOPLE'S AVE., TROY, N. Y.

1915 by the Nial Brothers Construction Company at a cost of about \$6,500.

The construction is described by A. E. Roche, city engineer, in his annual report as follows: "The approach is built of reinforced concrete throughout, with proper drainage afforded in each parking, and catch basins constructed on the Twelfth street side to afford drainage for this street. Provision has been made in the construction for the ornamental lighting of the approach by extending a conduit system throughout. Concrete sidewalks have been laid in front of the approach and on the Twelfth street section."

The pronounced improvement in appearance and durability are quite apparent from the "before and after" photographs.

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INLETS WITH AND WITHOUT BASINS.

The subjects of constructing catch basins and methods of cleaning them were discussed at some length recently by the Boston Society of Civil Engineers, as described in the March 15th issue; but little was said concerning inlets without basins by any of those present, with one exception. The remarks of this engineer covered the subject so well that we are presenting them this week with only slight abbreviation. There was one point illustrated by several of the other speakers, however, which he barely referred to—the fact that in many, and probably most, cities a large percentage of the catch basins are cleaned out so seldom that they serve no useful purpose.

It would appear from this discussion that New England cities were practically unanimous in using catch basins, and that the plain inlet is almost non-existent in that section of the country; and this in spite of the fact that a number of the speakers admitted that a large percentage of the catch basins in their respective cities were never cleaned at all, or, at last that, on the average, the catch basins were not cleaned more than once in several years. In Cambridge, Mass., for instance, there are 2,260 basins, and in 1915-16 there were 1,128 basin cleanings. And during no year since 1908 have there been more than 1,874 cleanings. Moreover, during each of the last three years, the average amount removed per catch basin, according to the records presented, has been the total capacity of the basin up to the outlet. One or two other cities also gave figures showing this same condition. Now if all basins are allowed to become full before they are cleaned, in some of them this condition had been in existence previous to the cleaning, and during this time the structures had not been working as a catch basin at all but only as a plain inlet. For it can hardly be expected that such a watchful eye is kept on every basin that each is cleaned the very day it becomes full. Moreover, the chances are that many

of the basins will reach this condition in the middle of a storm, and thus be ineffective for the remainder of that storm, at least. If the expense and other objectionable features of basins are endured, they should be kept in operating condition by cleaning them before they are full; otherwise they might far better be omitted and plain inlets be used.

The use of basins is sometimes advisable and even necessary, but they should be introduced only when they are necessary, and not as a customary routine practice of the office, without any consideration of the conditions affecting each individual inlet.

FOOD, LABOR AND WAR.

An organization known as the National Emergency Food Garden Commission has been formed with the idea of urging the American people to utilize all spare land about their homes for the growing of kitchen vegetables, with a view to relieving the food stringency which it anticipates for the coming year and to lowering food prices. Others not connected with this campaign have expressed their opinion that the war in which the United States is now a party will be won by food, and that one of the most important features of preparedness just now is insuring the largest possible crops this year; and there can be no question that the price of food would be lowered if every family in the country would raise a half or even a quarter of its own consumption of such vegetables as can be grown in a home garden. It would seem, therefore, that one of the most helpful ways in which cities could assist the government and the people at large at this time would be to encourage among its citizens the cultivation of as large food gardens as they have room for and can take care of.

We suggest that many cities, if not all, might even go further and establish municipal farms on land adjacent to the city and which would not otherwise be farmed this year. For laborers on this farm it could use the prisoners in city, county or state penal institutions. The number might be increased by learning a lesson from some of our southern states, where, when labor is scarce, they round up all unemployed men, arrest them as vagrants and then put them to work on public works as prisoners; first, however, offering them labor at wages and forcing them to work as vagrants only when this is refused. In addition to these, the inmates of the poor farms could probably be employed in the same kind of work more effectively than at present. Poor farm inmates are generally worked at farming more, apparently, with the idea of keeping them occupied than with a view to actual returns secured in the form of crops. All of this work should be put in the hands of an experienced, practical farmer, and an effort made to develop efficiency in the operation of the farm with as much care and thoroughness as is done in street paving or other public works.

This use of prisoners would overcome the objection that the labor unions generally advance when they are employed in other forms of labor, that this free or cheap labor in direct competition with non-criminal laboring men is unfair to the latter; while it also avoids the other horn of the dilemma, that giving no labor to these prisoners is a disadvantage to them from physical, moral, and mental points of view.

In many cities it might not be necessary to hire or purchase farming land outside the city, but citizens owning vacant lots within the city could undoubtedly be persuaded to permit the use of such land for this purpose; and the total area lying unused within the limits of most of our cities would aggregate sufficient to form quite a respectable farm.

TIDE-LOCKED SEWER OUTLETS.

In the letter given below, Mr. Allen calls attention to a problem in sewerage practice, and asks for information concerning practices and experiences in different cities discharging sewage into tidal water, where the land is so low that the invert of the sewer outlet must be placed below high tide. Washington, D. C., some years ago decided that pumping the sewage was the only satisfactory solution for such problem along its Potomac river front. The increase in sedimentation caused by admixture of salt water with sewage in the sewer is to be considered as an argument in favor of tide gates. The experience twenty-five years or more ago of cities that provided tidal reservoirs that filled with tidal water during high tide and were discharged through the sewer at low tide for flushing out deposits, will of course be considered, including the tendency of such flushed-out matter to redeposit at the sewer outlet. These are a few of the matters that Mr. Allen has undoubtedly studied. Will not all those who have had any experience, favorable or otherwise, in solving such problems give the writer of this letter and engineers at large the benefit of such experiences by relating them through these columns?

April 9th, 1917.

Editor Municipal Journal,

50 Union Square, New York City.

Dear Sir: In designing sewer outlets on tidal water fronts where the street elevations are limited it is frequently impracticable to avoid tide-locking the sewers at times of high water. In Manhattan the sewers in large areas are so affected twice a day and in at least one instance for a distance of a mile from the outlet, and a similar condition exists in the other boroughs of New York. The choice is presented of pumping the sewage at a very considerable expense, at least during high stages of the tide, or of permitting the surcharge of sewers, accompanied by a probable reversal of current and an accumulation of deposit to produce foul gases and from time to time require removal. The actual degree to which such conditions are believed to be detrimental has never, so far as the writer is aware, been expressed. What definite benefit, for instance, may be expected by substituting a decreased velocity for a reversal of flow by employing tide gates? What other devices, such as periodical flushing, have been actually tried out to avoid the installation of pumping or the crude method of hand-cleaning? Under what circumstances would a change in street grade be warranted? Apparently no attempt has been made in the past to standardize practice in this respect and it is here suggested that the experience of the sewer departments of our coast cities in dealing with the question of back flooding, the control of deposits in sewers along the water front and the elevation at which outlets are customarily placed with reference to mean or extreme high water level would be matters of much professional interest, and it is hoped this may bring out a discussion of the subject.

Yours truly,

KENNETH ALLEN,

Engineer of Sewage Disposal, City of New York.

ADVANTAGES OF WIDE TIRES.

If a wheel constructed of an absolutely unyielding material were used on a roadway with an unyielding surface, a knife-edge rim might require least tractive power. But as the road surface becomes more yielding the maintenance of traction at a minimum requires a widening of the tire. For any given surface there is a certain width of tire that gives minimum tractive resistance, and the use of one either narrow or wider increases such resistance. But the increase is less for wider than for narrow tires, and in addition the wide tires benefit any road, while the narrow ones are apt to injure it.

Experiments have been made by E. B. McCormick, chief of the Division of Rural Engineering of the U. S. Office of Public Roads, on hauling on dirt roads. The road was plowed up, graded, and rolled with a 10-ton roller weighing 450 pounds per inch width of wheel. A 5,000-

pound load was pulled over it in wagons having 1½, 2, 3, 4, 5, and 6-inch tires and the pull required in each case was measured. The pulls required for the several cases were 91 pounds, 82, 74, 69, and 66 pounds for the 1½ to 5-inch tires respectively. The 6-inch tire required slightly more than 66 pounds, showing that, so far as hauling was concerned, there was no advantage in using tires for 5,000-pound loads that are more than 5 inches wide, and little in using more than 4 inches width.

REFUSE COLLECTION COMPLAINTS.

In many and perhaps the majority of cases of complaints by citizens of failure of refuse collectors to remove material from their premises, the fault lies really with the citizen, in that he has failed in some respect to observe the rules of the department. In Springfield, Mass., in order to be able to tell complainants wherein they were delinquent, or perhaps to forestall their complaints, each collector is required to turn in at the end of each day a slip for each premises where he failed to make a collection, on which the cause is explained. This slip reads:Street, No.....Called at the above named premises.....191..and were unable to collect the Ashes—Rubbish—Garbage—on account of—Locked door—Walks not shoveled—Not in convenient place—Not separated—Rickety barrels—Frozen barrels—Large barrels—Builders' rubbish—Garbage not on ground floor—Garbage not in cans."

The collector checks off the items applying to the case in question.

The following day the deputy superintendent sends, addressed to "Occupants of No.....,Street," a postal card reading: "We are informed by our collector who called at your place yesterday for....., that they found..... It is hoped that at the next regular collection the conditions will allow our men to remove the same in accordance with the rules of the department. Very truly yours, E. G. Barnes, Deputy Supt."

SPRINKLING DISINFECTANT ON STREETS.

The hot and moist atmosphere in many sections of the South, perhaps, explains why the general outdoor use of disinfectant has been more popular there than in the North. Not so many years ago a number of southern cities forbade the opening of trenches, or any other exposure of the street soil, during the hot summer months, and required the sprinkling of all such upturned soil with disinfectant during the months when trenching was permitted.

In Live Oak, Fla., disinfectant is used in the water sprinkled on the streets for laying the dust, a contrivance being used for this purpose which was devised by L. T. Morgan, city engineer and superintendent of water works. This contrivance consists of a galvanized iron tank of 10 gallons capacity, which is mounted on top of the water tank by means of two saddle blocks. The saddle blocks were cut from 2x10-inch plank, stood vertically and cross-wise of the sprinkler tank, the bottom edges being sawed to fit the top of the sprinkler tank and the top edges being sawed to fit the bottom of the small disinfectant tank referred to. This small tank has a plug at the top for filling with disinfectant and a gauge showing the height of disinfectant in the tank; while at one end of the tank is a faucet for drawing out the disinfectant. This tank is set so that the faucet discharges into the opening in the top of the sprinkler tank through which it is filled with water, the same being immediately behind the driver's seat. Then as the driver fills the water tank with water, he opens the faucet in the disinfectant tank and allows enough of this to run in with the water to provide the desired strength of disinfectant.

The WEEK'S NEWS

The Highway Departments of South Carolina, Montana and Indiana—Paving in Pennsylvania Cities, Wilmington and Bridgeport—Typhoid in Largest Cities—Water Supply of Springfield, O.—Rate Cases in Erie and Denver—The Chester Catastrophe—Two-Platoon Progress in Minneapolis, Philadelphia and Massachusetts—Mayor Gill Freed—Chicago and Dallas Elections—Attempt to Abolish Commission Plan in Pennsylvania—The Cities and the Garden Movement—Baltimore's Civic Center Plans—Cleveland's City Planning.

ROADS AND PAVEMENTS

South Carolina's State Highway Department.

Columbia, S. C.—Capt. J. Roy Pennell, of Anderson, has been appointed state highway engineer by the State Highway Commission. Capt. Pennell is a civil engineer of wide experience. The commission decided to begin the licensing of automobiles on April 7 and all automobiles must have a state license by July 1, or there will be inflicted a fine of twenty-five cents for every appearance on the public highways after that date. Capt. Pennell will open an office in Columbia immediately and is ready to lend assistance to any county in the matter of highway building. He will appoint a temporary clerk and stenographer at once. The commission postponed the election of secretary and assistant engineers and they will be guided in this matter largely by the recommendations of Capt. Pennell. The members of the commission are as follows: Prof. M. Goode Homes, of the university; Prof. R. G. Thomas, of the Citadel; Prof. H. H. Houston, of Clemson; J. Monroe Johnson, of Marion, and C. O. Hearon, of Spartanburg.

\$750,000 Paving in Bridgeport.

Bridgeport, Conn.—The contract of Warren Brothers to furnish warrenite to the city at \$1.20 a square yard, not including extra labor and grading, has been accepted by the common council, and simultaneously the expenditure of \$750,000 from bond issues authorized to pay for the paving, which will start this spring. The contract provides the usual five-year guarantee. The firm will lay and furnish bituminous binder at \$5 a cubic yard, and for labor and materials furnished in the preparation of the grade, as directed by the director of public works, the actual cost plus five per cent for profit shall be charged. The city clerk was directed to notify property owners on streets where the pavement will be laid to make such improvements as necessary. If not completed within 30 days after ordered, the work will be done under the supervision of the director at the property owner's expense.

Paving in Pennsylvania Cities.

Harrisburg, Pa.—Facts about street paving in cities of the third class in Pennsylvania, compiled by the division of municipal statistics of the department of labor and industry, show that Harrisburg heads the list of thirty municipalities with a mileage of 76.167 miles. However, Erie, with 68.32 miles of paving, leads in yardage with 1,392,310.27 square yards against 1,213,747.64 yards in Harrisburg. In both cities asphalt is the principal kind of pavement in use. The street paving statistics were obtained from city engineers, in each municipality, by J. Herman Knisely, municipal statistician of the labor and industry department, and submitted in a report to commissioner John Price Jackson. Altoona is the third city in the list according to mileage, with 48.21, while Wilkes-Barre ranks fourth with 47.322 miles. In the comparison between these two cities, Wilkes-Barre, while having less mileage of pavement than Altoona, leads in yardage with 747,302 square yards of asphalt as against 709,926.8 square yards of brick and asphalt pavement in Altoona. The city of Chester, with a record of 40 miles of asphalt paving, exceeds both Wilkes-Barre and Altoona on the yardage basis, having 800,000 square yards of asphalt pavement. Johnstown, with 43.36 miles of brick and asphalt, has 653,705.7 square

yards. Allentown, with 40.25 miles of asphalt, exceeds the Johnstown yardage, however, with 665,653 square yards. Municipalities in the tabulation having less than 40 but more than 30 miles of paving are: McKeesport, 36.55 miles; Newcastle, 32.07 miles, and Reading, 31.469 miles. Seventeen of the cities have paved principally with brick; six cities with asphalt; three with brick and asphalt; two with vitrified block and two with wood block. The tabulation goes into complete detail regarding classes of paving, method of assessment, proportion paid by cities, unit cost of various pavements, cost of curbing and similar information. It shows that the entire cost of paving is assessed against abutting property owners only in Altoona and Conneville, while the other extreme, where the municipality bears all the paving cost, exists in Lancaster, Lock Haven, Pottsville and Reading. Miles of paved streets and yardage in other cities in the tabulation are as follows:

City.	Mileage.	Yardage.
Oil City	23.07	349,100
Meadville	16.26	271,616
York	16.179	...
Uniontown	16.15	245,064
Williamsport	15.31	...
Bradford	15.05	234,274
Conneville	13.536	...
Titusville	10.1	177,760
Lancaster	10.	156,139
Franklin	9.4	...
Carbondale	7.8	123,052
Pittston	7.5	...
Monongahela City	7.10	119,905
Dubois	7.	...
Corry	5.6	...
Hazleton	5.31	105,217
Easton	5.08	98,247
Lebanon	3.4	72,000
Lock Haven	2.2	44,130
Pottsville	...	36,450

Paving Assessments in Wilmington.

Wilmington, Del.—The following is a summary of bills recently passed by the Legislature which deal with assessments on abutting property owners for paving. The bill assessing existing improved pavements is known as the Baltimore plan and classifies all properties in the city of Wilmington into three groups, A, B, C. Class A properties are those situated on streets having roadways over 30 feet wide; class B properties are those on streets with roadway between 20 and 30 feet in width; class C properties are those on streets with roadway 20 feet or less in width. The tax on class A properties is 16 cents per year per front foot abutting on the street, class B properties 12 cents, class C properties 8 cents. Corner properties are not assessable for more than twice the shortest frontage should both abutting streets be improved. The tax continues for a period of ten years, unless a majority of the frontage owners petition for the repaving of the street, at which time the tax ceases. Property owners who have paid for the existing street surfaces in front of their properties are exempted. The city shall keep the streets in repair out of general funds. The second bill provides that streets not improved shall be paved upon petition of a majority of frontage owners and one-third of the cost of such paving shall be borne by the owners of property abutting on each side of the street. The city pays for the pavement of the remaining third and the intersections. The property owners may pay for this work any time within four months after its completion and earn a small discount. If they elect they may pay for it in semi-annual payments extending over a period of three years. Corner properties are not required to pay for more than twice the shortest frontage, the city paying for the remainder out of

the general funds. The city also pays for repairs out of the general funds. That portion of the payment for which the traction company is liable on streets having trolley tracks is deducted from the cost borne by the property owners. "Improved pavement" is defined in the bills as "any substantial pavement above the grade of ordinary macadam, and shall include cobble, granite or Belgium blocks, paving brick or blocks, wood blocks, asphalt, or concrete blocks, sheet asphalt, bitulithic, bituminous macadam, and bituminous concrete."

Montana's State Highway Commission.

Helena, Mont.—Governor Stewart has approved senate bill 167, creating a state highway commission composed of twelve members, three of whom will constitute an executive committee. After approving the bill the governor appointed the commissioners. He also approved senate bill 170, relating to the classification and improvement of highways. As members of the highway commission the governor named the following persons, six democrats and six republicans, the districts being specified by the law:

District No. 1, composed of counties of Lincoln, Flathead and Sanders: F. H. Johnson of Kallispell, for the term of four years.

District No. 2, composed of the counties of Mineral, Missoula and Ravalli: D. T. Curran of Missoula, for the term of one year.

District No. 3, composed of the counties of Beaverhead, Madison and Gallatin: C. M. Buford of Virginia City, for the term of two years.

District No. 4, composed of the counties of Silver Bow, Deer Lodge and Granite: Oscar Horn of Butte, for the term of two years.

District No. 5, composed of the counties of Lewis and Clark, Broadwater, Powell and Jefferson: Frank Conley of Deer Lodge, for the term of three years.

District No. 6, composed of the counties of Cascade, Musselshell, Meagher and Fergus: H. A. Templeton of Great Falls, for a term of four years.

District No. 7, composed of the counties of Chouteau, Teton, Hill and Toole: C. W. Morrison of Fort Benton, for the term of one year.

District No. 8, composed of the counties of Blaine, Sheridan, Valley and Phillips: A. W. Mahon of Glasgow, for the term of three years.

District No. 9, composed of the counties of Carbon, Stillwater, Sweet Grass and Park: Samuel Weed of Columbus, for the term of two years.

District No. 10, composed of the counties of Rosebud, Yellowstone and Big Horn: A. N. Richardson of Forsyth, for the term of one year.

District No. 11, composed of the counties of Custer, Prairie and Fallon: H. R. Wells of Miles City, for the term of three years.

District No. 12, composed of the counties of Wibaux, Dawson and Richland: T. F. Hagan of Glendive, for the term of four years.

Indiana's Road Board.

Indianapolis, Ind.—Governor Goodrich has appointed the members of the new State Highway Commission, as provided for under a law passed by the 1917 Indiana Legislature in its closing hours. The commission includes four members, who select a state highway engineer, in whose hands is much of the power of the commission over roads. The men appointed by the governor are: Lorenzo H. Wright, Indianapolis, Republican, master of the Indiana State Grange; David C. Jenkins, Kokomo, Republican, manufacturer, formerly a state senator; Haines Egbert, Goshen, Democrat, lumber manufacturer, and Lewis Taylor, a Democratic farmer of Warrick county. All of the members of the commission are men of means, and the small salary of \$600 annually that goes with the positions will not pay them commensurately with their labor for the state. During the first year of the work of the commission the members probably will be forced to devote much time to their duties, as indications are that a great deal of the county engineering work throughout the state will be transferred to them. The commission will meet and organize soon, selecting its own chairman. Already county authorities, it is reported, have been turning their troubles over to the governor for the road commission. In some counties fears have been expressed that the county engineers were inefficient, or worse, in the road contracts, and the desire has been expressed that the new state commission be named at once to take over the questions pertaining to contracts and similar road matters, and thus relieve the local situation. It is probable that the new commission will be plunged into road work immediately. It will open headquarters, probably in the state-house, as quickly as possible.

SEWERAGE AND SANITATION

Typhoid Fever in the Big Cities.

Chicago, Ill.—The American Medical Association has just published its fifth annual survey of typhoid fever in the nine largest cities in the country. The death rates, per 100,000 population in cities over 500,000 population, are given in the following table:

	1916	1915	Average 1911-1915	1906-1910
Boston	3.5	5.5	8.0	16.0
New York	3.8	6.0	8.0	13.5
Chicago	5.2	5.4	8.2	15.8
Cleveland	5.3	7.8	10.2	15.7
Philadelphia	7.8	6.6	11.2	41.7
Pittsburgh	8.6	10.3	15.9	65.0
St. Louis	9.4	7.0	12.1	14.7
Detroit	15.0	12.8	18.1	21.1
Baltimore	18.0	21.9	23.7	35.1

Concerning Boston and New York, the cities having the lowest rates among cities of over 500,000 population, the report says: "Boston achieves the best position, and, indeed, reaches a remarkably good figure (3.5), the lowest point yet touched by any member of the group. Boston, however, is closely pressed by New York for first place. The health officials in these two cities are to be congratulated on the success of the unremitting campaign they have waged in the past ten years against typhoid fever. The painstaking efforts in New York to discover carriers and place them under control have evidently borne good fruit. The New York department of health comments, in one of its recent weekly bulletins, on the absence of public interest in the success which has attended the efforts of the department in the reduction of typhoid fever. Little notice has been taken of the fact that within ten years the typhoid rate has been reduced to less than one-third its former dimensions. This difference in rates represents a saving of over 600 lives, and it is certainly an achievement on which any administrative health authority might pride itself. The record deserves the widest possible publicity. Boston and New York have set a high standard for the rest of the country."

Instruction in Mosquito Elimination Practice.

New York, N. Y.—The Brooklyn Institute of Arts and Sciences announces its courses of instruction offered at the Biological Laboratory, Cold Springs Harbor, Long Island. The courses begin on July 5 and continue for six weeks. One of the courses is designed to train persons for practical work in the elimination of mosquitoes and flies. This course will include surveys and mapping, identification of species, life history of the different species of mosquitoes and flies, specifications for treatment and elimination. The laboratory fee, including one course of instruction, the general lectures and the use of the laboratory privileges will be \$30,000. The whole expense to the student for the session will be from \$75.00 to \$100.00. Dr. Charles B. Davenport, Cold Springs Harbor, Long Island, N. Y., is in charge of the courses.

Progressive Health Legislation in Oklahoma.

Guthrie, Okla.—According to a statement by Dr. John W. Duke, commissioner of the state board of health, the 1917 legislature took a liberal view of the necessity for conserving the public health and greatly extended the powers of the state board of health in a number of important directions. Three of the most important public health measures which have been passed in years were the vital statistics registration law, the sanitary engineering law and the law giving the board control over the manufacture of soft drinks. The new vital statistics law is an exact prototype of the model registration law drawn up under the direction of the United States government. It aims to furnish fully and accurately the very important statistics of all the births and deaths in a given state. It is a practical law, which has been tested in a number of states and has met with success. It is hoped that after the law has been in operation a short time Oklahoma will be eligible for admission into the federal registration district. Under the

new law the reporting and collecting of vital statistics will be under the direction of a state registrar, assisted by local registrars throughout the state. Under the sanitary engineering law the state board is granted the power to pass on all public water supply and sewage problems throughout the state. In order that no injustice should be done it is provided that the law shall not go into effect for a year and a half from the time of its passage. This is to permit the remedying of defects in present water supply and sewerage systems. The state board of health will act in harmony with the state engineering department in the carrying out of this law. A sanitary engineer from the latter department will be assigned to consider all water supply and sewage plans. No construction contracts can be let unless they have the approval of the state board of health. The law enacted giving the board authority to pass on the purity of all soft drinks will also have important bearing on the health of the state. Under the provisions of this law the board will have jurisdiction in regard to the purity of all materials used, the cleanliness of the methods of manufacture and other factors pertaining to the purity of the finished products.

WATER SUPPLY

Water Plant Suit Before Supreme Court.

Denver, Colo.—The legal proceedings known as the Wheeler-Lusk case, in which certain Denver taxpayers seek to enjoin the city from issuing bonds with which to build a municipal water plant, has reached the United States Supreme court. The suit, started several years ago, has gone through the federal district court and the court of appeals, in each instance decided for the city. Word of the appeal to the highest court has reached city attorney Marsh. The taxpayers sought to restrain the city from issuing \$8,000,000 bonds to purchase or construct a water plant. In the first hearing, before federal judge Lewis, it was held that the city had the right to proceed with the project.

To Conserve Water Supply.

Springfield, Ohio.—That the extension of the underdrain system is the most practicable method of conserving the water supply for the city, which he declares is running short, is the conclusion of George S. Cotter after a detailed comparison of this system with that of metering the entire city. His report shows that the extension of the underdrain system will give insurance against a future water famine at a less cost to the city than the metering of the services. The extension of this system will include the securing of the water rights in Buck creek and the purchase of a large tract of land above the pumping station. The upkeep and the interest on the money is figured by the superintendent in his report, and the conclusions, as far as finances are concerned, are in favor of the extension. Mr. Cotter goes into detail concerning the meter system as a means of conservation of the supply. He shows that the total metered water pumped in 1916 was 688,304,500 gallons, of which 259,590,000 gallons was for domestic consumption, with a rate of 10.4 cents per 1,000 gallons, and 488,714,500 gallons was for all other purposes, for which a rate of 5.1 cents per thousand gallons was collected. The total amount collected for metered water was \$69,613.45. The total water consumed on the flat rate was 1,919,607,580 gallons, for which the collection was \$42,494.76, the rate being 2.2 cents per thousand gallons, making the total collection \$113,041.02, and the rate per 1,000 gallons for all water pumped 4.2 cents. The average daily consumption on the metered service was 38 gallons, while the flat rate daily average consumption was 122 gallons. Mr. Cotter shows that on this basis a saving of 1,337,497,880 gallons a day, or nearly one-half of the actual water pumped last year, should the entire system be metered. The earnings would then be \$107,498.06, or a reduction of \$5,542.96 over the collections last year, but it is shown that the saving in the fuel cost would be \$3,395.71. It is estimated by Cotter that it would cost \$152,000 to completely meter the system. The interest on this amount, together with the

expense of additional meter readers, after deducting the saving in fuel, would amount to a total annual loss of \$14,595.67, which represents the difference in cost between the present method and a fully metered system. Cotter says: "We must not pass over without a casual observance of the value of the great saving in consumption of water. We have shown that the water consumed would be reduced almost one-half by the metering of all services. We have also shown that the meter rates would have to be increased, but this increase, to equal our present revenue, would not be appreciable. In fact, it would only be necessary to increase one-tenth of one per cent per thousand gallons. This would mean only 40 cents a year to the average family."

Instead of this Cotter submits the proposal to extend the underdrain system for an additional water supply. In his report he estimates that the land necessary to tap the water bearing gravel drift northeast of the pumping station would cost \$20,000. The construction of the system would cost \$210,000, making a total of \$230,000 for the system. He points out that the operation of this system after installation would cost practically nothing, and says that the maintenance would not exceed \$500 a year. The interest on the money invested would be \$14,000 a year, or a saving of \$5,800 a year over the proposed metered system. It is shown in the report that all meters installed would have to be renewed in ten years, as against no depreciation in the underdrain system in the same length of time. In money it is shown that the underdrain system would be cheaper by \$15,000 a year. The superintendent says: "Our conclusion, therefore, is in favor of a large water supply, and allowing the consumer to install meters at his own pleasure. We know that the inducements are sufficient to warrant the consumer in installing a meter, as his bill is materially reduced under the meter system. In fact, the meter in most cases more than pays for itself the first year. We know, furthermore, that the average reduction last year was \$7.64 per service. There were 700 meters installed last year, and the loss to the department through this was \$5,348." One of the most gratifying facts shown in the report for last year is that the earnings were increased more than \$10,000 over the preceding year, and more than \$11,000 over the year of 1914. The daily average water pumped last year was 7,422,366 gallons. The largest amount pumped in any day was 11,259,214 gallons. The average per capita consumption was 124 gallons per day. The report shows that the total value of the water works department at present is \$1,314,645.28. There are 3,740 meters now in service in the city, of which 3,432 are domestic and 308 are for manufacturing plants.

Waterworks Systems in Chile.

Santiago, Chile.—A recent Chilean law gives to the President of the Republic authority to dictate the regulations under which waterworks systems in Chile, which have been financed or may be financed by the government, will be exploited and conserved, and which establishes the amounts to be spent each year, from 1917 to 1927, and the places where waterworks systems are to be improved or installed. The amounts to be spent and the improvements or installations are given include for the year 1917, 1,220,000 pesos, paper (paper peso equals 14 cents), for the following services: Improvement of the waterworks systems at San Felipe, Los Andes, Coquimbo, Serena, Ovalle, Renca, Rancagua, Curicó, Linares, Cauquenes, Concepcion, Talcahuano, Cañete, and Puerto Montt. Installation of waterworks systems at Illapel, La Union, Búlnes, Molina, Cartajena, San Antonio, and Lillole. In 1918, 1,675,000 pesos are provided; for 1919, 1,660,000; for 1920, 1921 and 1922, 1,670,000 pesos each; 1,660,000 for 1923, and 1,650,000 for each year from 1924 to 1927 inclusive. In each year preference will be given to the installation of service in the capitals of departments which appear in this schedule and which have no installation. In order to make this schedule effective the surplus obtained annually from these services will be placed on deposit with the fiscal treasury at Santiago, and on the completion of the works contemplated in the above schedule this surplus will be entered in the general revenues of the nation.

STREET LIGHTING AND POWER

City to Fight Rate Increase.

Erie, Pa.—The Pennsylvania Gas company will not increase its rates to thirty-seven cents a thousand feet without municipal opposition, mayor Miles B. Kitts has announced. The city will combat to the fullest extent the proposed advance in rates announced by the company. The city is now engaged in perfecting the case against the Pennsylvania Gas company to compel it to give Erie an adequate supply of gas and the rate increase will be fought in the same connection. It is understood Mayor Kitts will force the gas company to produce its books and make public its source of supply. The new rates, which must be approved by the commission, are to become effective May 1. The present rate for domestic purposes is thirty-two cents a thousand feet, with two per cent discount for payment in ten days. This discount will apply to the proposed new rate. Commercial users will pay the same rate but get a three per cent discount. The twenty-five per cent discount for schools and charitable organizations is abolished.

Municipal Light Plant Defeated.

Independence, Kan.—The proposition to construct a municipal lighting plant was defeated by a vote of 536 to 1,215. A vigorous campaign in favor of the proposition had been carried on by a local newspaper.

Company Loses in Rate Case.

Denver, Colo.—The public utilities commission has entered an order overruling the answer of the Denver Gas and Electric Light company to the petition of thirty-one merchants and business men of Denver, charging excessive prices by the company for gas and electricity for all purposes. The order requires the company, at a date to be fixed by the commission, to make an inventory of all its property used in the manufacture of gas and electricity, to be used by the commission in readjusting the rates to be charged by the company. The proceedings began last November. On March 25 the company filed its answer, wherein it alleged: 1. That the commission had no right to change rates named in contracts between the company and its customers. 2. That Denver, being a charter city and operating under the widest possible home rule provisions, could make any rates it saw fit in granting franchises to a utility company, and that, having fixed these rates, the commission could not interfere. 3. That the franchise voted in 1906 was a direct contract under which the company obtained vested rights that cannot be reviewed by the commission; that where such a franchise fixed rates those rates were not within the jurisdiction of the utilities commission. The commission by its decision overrules all those contentions and finds that the state is supreme as to franchises and has complete jurisdiction in charter cities, as well as unchartered cities or in the rural districts. Franchise contracts between cities and utility corporations do not bind the state, the commission rules, holding the state under its broader powers has the right to step in and see that equity prevails between utilities and consumers.

FIRE AND POLICE

Munitions Explosion Kills Over 100.

Chester, Pa.—About 132 munition workers, most of them girls, were blown to bits, or so terribly riddled by flying splinters of steel that they died later, in an explosion at the plant of the Eddystone Ammunition Corporation, half a mile from this city. Nearly eighteen tons of black powder, ignited in some way not yet determined, set off 10,000 shrapnel shells in the loading and inspecting building, completely demolishing that structure and causing a series of detonations that shook a half dozen boroughs within a radius of ten miles of the munition plant. There were at least fifty explosions, three heavy ones caused by the black powder, most of which was in twenty-five-pound cans, and the rest by three-inch shrapnel shells. Dense clouds of black smoke filled the building, in which about 350 persons were at work, immediately after the first explosion,

and as the men and women made a rush for the exits the roof and walls were shattered by the two other explosions, which followed each other in quick succession. More than fifty tons of smokeless powder were stored in a low wooden building near the loading and inspection plant, and one of the first steps taken by the emergency fire department and the company's special guards was to try to prevent this powder from being exploded. The Chester and Eddystone fire departments arrived in a few minutes but could do nothing except help the injured. Fire departments of half a dozen nearby villages and cities, including Philadelphia, answered the general alarm.

Two Platoons in Minneapolis.

Minneapolis, Minn.—One hundred new firemen have been added to the Minneapolis fire department force in order that enough men may be available for the operation of the two-platoon system authorized by the state legislature. The departmental total hereafter will be 530 men. The "rookies" were distributed among the various stations so that small groups of them will be working with experienced firemen. They will attend a school of instruction next month.

Two-Platoon Legislation.

Philadelphia, Pa.—The Stern bill providing for a two platoon police system for Philadelphia was approved by Governor Brumbaugh. The bill was an amendment to a second class city law, passed in 1915. The new law is to take effect the first day of January, 1918. It provides for the dividing of the officers and men of the companies of the uniformed fire force in first class cities, excepting the chief engineer and assistant chiefs, into two platoons, one to perform day service and the other night service. The act provides that the hours of the day service shall not exceed ten, commencing at 8 in the morning and the night service shall not exceed 14, commencing at 6 in the evening. In cases of riot, serious conflagration or other emergency, the chief engineer of the bureau of fire or the assistant chief deputy or chief officers in charge at any fire shall have power to assign all the members of the fire force to continuous duty or to continue any member on duty if necessary.

Boston, Mass.—The two-platoon bill for firemen in cities was defeated by "gumshoe" methods in the senate. There was not a word of debate on the measure, and when the first call of the roll had been completed the vote stood 17 to 16 in favor of ordering it to a third reading.

GOVERNMENT AND FINANCE

The Ohio Institute for Public Efficiency.

Columbus, O.—The Ohio Institute for Public Efficiency has recently issued its third annual report which is a very striking record of accomplishment toward its object "to make Ohio lead in sound, constructive, and steady progress along social and civic lines." Its avowed methods are stated as follows: "By impartial and thorough investigation of conditions, needs and plans, by promoting the efficiency and adequacy of state and local government; by promoting the co-operation and efficiency of civic and social organizations; by informing public opinion; and by educating in the principles and practice of public efficiency." The year's work of the institution has covered a wide range of endeavor and its activities have resulted in a significant increment in civic progress in the state. The accounting department of the institution, under the direction of L. A. James, has devoted its principal efforts during the year to perfecting and installing the most economical and efficient accounting system which it could devise for municipalities. While embodying the principles generally accepted in the practice of advanced cities, the system avails itself of the latest mechanical labor-saving devices, with the following advantages as a result: Daily control over accuracy of accounts; greater promptness in producing monthly statements; wide range of information; possibility of greater economy of operation; greater legibility; more effective control by the auditor. The system was installed in Akron at the request of the Akron Bureau of Municipal

Research. Procedure based on the same principles, but using long-hand methods, were worked out by the State Bureau of Accounting and installed in Columbus and Toledo. The accounting department has also continued its work upon a standardized classification of accounts capable of being used by the state and all its subdivisions. In response to direct request from prominent social workers, and with their co-operation, the institute established in July, 1916, a Department of Social Service with a program leading to "ultimate elimination, as far as possible, of dependency and delinquency as forms of social waste, and the establishment of progressively higher standards of living." Fred C. Croxton, formerly with the State Industrial Commission, is in charge of the department. The work has included a social survey of Portsmouth, conferences and a particularly vigorous and far-seeing campaign for adequate provision for the feeble-minded. Along the lines of municipal research the Institute, during the year, was retained by the Toledo Commerce Club and the Columbus Bureau of Municipal Research. Gardner Lattimer, of the institute's staff, has been engaged in Toledo in research on the financial condition of the city; in the campaign for deficiency bonds; promotion of social center organization; public health, budget-making, etc. In Columbus attention was given to budget and purchasing methods, social welfare questions, and the extension of policy of the municipal electric light plant. The future program purposes a continuation of work along these lines and includes the fields of accounting and budget-making; state fiscal organization and taxation; feeble-mindedness; analysis of social legislation; study of exploitation of the poor; sickness insurance; philanthropic activities; county social agencies and clearing house for sympathetic interchange of information and views. G. W. Lattimer is president of the institute and R. E. Miles is executive director and secretary.

Seattle Officials Not Guilty.

Seattle, Wash.—The jury in the case of mayor Hiram C. Gill, chief of police Charles L. Beckingham and city detectives Meyer M. Peyser, John Poolman, James Doom and Daniel J. McLennan, on trial in the United States district court charged with conspiracy to violate the federal laws by importation of liquor into the state of Washington, returned a verdict of not guilty as to all the defendants. Mayor Gill was accused of taking \$4,000 from Logan Billingsley for dropping suits against the Billingsley brothers, liquor sellers, returning incriminating papers and promising immunity to them. Chief of police Beckingham was accused of taking bribes of \$1,200 from Fred Billingsley. The detectives were accused of taking money from the Billingsleys for letting liquor shipments to the Billingsleys near the city while they were guarding the waterfront. The sensational trial was begun March 6. The principal witnesses for the government were Logan and Fred Billingsley and their former employees, confessed liquor sellers, and the witnesses for the defense were chiefly policemen and confessed liquor sellers, many of them former Billingsley employees. Ninety witnesses testified in the case, including the six defendants.

Chicago Votes Against Big Improvements.

Chicago, Ill.—At a general election for aldermen and on bond issue proposals the voters defeated the proposed issue of \$1,000,000 for garbage disposal plants. This question was voted on at the November election when a \$2,000,000 issue was proposed. It was then defeated because the women's organizations of the city had opposed it on the ground that no expert advice was provided for. This time the women supported the measure, but it was defeated. The election was marked by smashing of the machines of both parties. Out of the 35 aldermen to be elected, the Municipal Voters' League endorsed or "preferred" candidates in 30, and of those preferred 19 were elected. Alderman Merriam, the progressive leader in the council, was defeated for re-election, although over 8,500 voters wrote his name in on the ballot, as he was running as independent, having been tricked out, it is reported, in the primaries. Bond issues of \$250,000 for a boys' correctional school; \$150,000 for public comfort stations and \$750,000 for a contagious disease hospital were

approved. An issue of \$200,000 for lake shore protection was defeated by a vote of 159,949 to 150,330, a majority of 9,619. It is interesting to note that while the men opposed the garbage plant issue by 121,084 to 114,273, the women favored it by 37,812 to 36,456, a total of 157,540 against 152,085 in favor, or a majority of 5,455 against. The men voted for comfort stations by 118,177 to 110,094; the women voted against them by 38,208 to 35,057, the measure receiving a vote of 153,229 in favor against 148,302, a majority of 4,927.

Dallas Favors Franchises.

Dallas, Tex.—At the recent general election at which a number of referenda were considered, the citizens voted in favor of both the franchises of new light and railway companies. The street railway franchise, which will give \$1,000,000 improvements to the system, was approved by a vote of 7,561 to 3,908; the lighting franchise, which will mean \$2,000,000 to the electric system, was approved by 7,467 to 3,905. The franchise for the Automatic Telephone Company was favored by 8,152 against 3,704. The following six initiative ordinances were also approved by large majorities:

Eight-Hour Day Ordinance—An initiative ordinance prohibiting public utility corporations from requiring or permitting their employees to work more than eight hours in any one day, except in case of emergency.

Labor Organization Ordinance—An initiative ordinance prohibiting public utility corporations from preventing their employees from joining labor organizations.

Safety Appliance Ordinance—An initiative ordinance requiring safety appliances on street railway cars.

Franchise Rates Ordinance—An initiative ordinance prohibiting public utilities from raising their rates unless ratified by a vote of the people. This ordinance is reported to be contrary to the provisions of the proposed franchises, which provide for raising or lowering the rates, within specified limits, if not above the maximum stated, dependent upon earnings.

Jitney Ordinance—An initiative ordinance repealing all ordinances regulating jitneys passed by the board of city commissioners; providing for an indemnity fund; providing for eight hours' service, with no regulation as to time when service shall be rendered, and permitting detouring from routes. This ordinance, if adopted, will prohibit the board of city commissioners from passing any regulations governing the operations of jitneys in the city, as the ordinance may only be amended by a vote of the people.

White Rock Fishing Ordinance—An initiative ordinance permitting fishing in White Rock municipal reservoir with certain specified safeguards with reference to health and sanitation.

Cities Fight Attack on Commission Plan.

Harrisburg, Pa.—Senator Edward E. Beidleman's third class city "ripper," which would cause a return to ward and party politics in the cities of the state, is meeting with determined opposition from the cities of the third class. A brief setting forth the apparent intents and purposes of the bill, together with reasons why it should not be enacted into law, has been prepared by attorney James A. Gardner, of New Castle, chairman of the law committee of Cities of the Third Class. This has been circularized throughout the state and it urges all municipalities which would be affected by the passage of the bill to put pressure immediately on their senators and representatives to kill it. The circular says of the bill: "Its principal features, and to which we strenuously object, are as follows: 1. The election of a legislative body or council consisting of one person from each ward. 2. The election of all officers on a party or partisan ticket. 3. The entire abolition of the commission form of government with no heads or superintendents of departments." Thirty-eight cities would be affected by this drastic piece of legislation, including four which just cast their lot with the third class cities at the last election. It is insisted that nothing more or less than the form of government attracted the people of these cities to this form of charter. Several terms in the bill are pointed out as most dangerous. One of these is the wiping out of the non-partisan ballot, for the bill provides that city officials be nominated at the fall party primary, and on tickets. Such provisions prevent citizens' tickets, or any other kind not regularly represented in the primary. Mr. Gardner says: "This shows that the whole trend and purpose of the proposed act is to re-establish party politics in city government." The appeal urges cities to prevent their being further exploited without giving the present form a thorough test. It shows that, under the present system,

there is a director caring for the city's business at all times, while under the old ward system the business was glanced at monthly and important matters needing immediate action were often buried for months in irresponsible committees. Another feature held up in defense of the present system is the fact that officials are now elected by a majority vote on the non-partisan ballot, there being no opportunity for a minority officer because he has a plurality over the candidates of other parties. In another pamphlet discussing pending legislation, the same bill comes in for the following criticism, from the same source: "It has been well known that certain politicians have been smarting under the present form of our city government, because there is small chance to exploit it, as to reward with office, their supporters or followers. There are some partisans who consider that they must name all the city officials. This ignores the fact that municipal government is a business proposition entirely, in which partisan politics should have no place. So long as cities are run on party lines they will never meet the public expectations. The commission government may not have met expectations in some of our third class cities, but it must be borne in mind it will not run itself,—it is only a business method, far superior to anything we ever had. If the electors in each city will keep partisanship out of their elections, and vote for the most competent and efficient candidates, there will be no difficulty."

The Beidleman bill, in general, is a complete code and the changes made from the old law, in addition to that requiring a single council with one representative from each ward, are: "(A) The election of councilmen for four years, as was the case of select councilmen under the old law, and making the terms of city solicitor, city treasurer, city controller and city engineer four years, instead of three, as under the old law prior to the passage of the Clark law. (B) Authorizing the council, in case no board of health shall be created, to exercise all the rights and duties of such boards of health. (C) Authorizing the mayor to veto any items in the ordinance making appropriations. (D) Empowering the mayor to dismiss a policeman with or without cause. (E) Authorizing the mayor to dismiss for cause any member of the board of health." Many of the latter third class cities have protested against the legislation and have stated that the commission form is satisfactory. A bill providing for a number of changes in the Clark act has been before the legislature. The legislation is backed by the League of Third Class Cities. Practically all of the changes provided for in the bill were discussed by the representatives of the various cities in convention here last summer. Changes include:

Lengthening term of four councilmen to four years, two to be elected every two years.

Lengthening terms of all other city officers to four years.

Making appointment of city solicitor effective from first Monday in May, term of office four years.

Giving superintendent of finance power to appoint a deputy and to administer oaths.

Restricting extent of referendum proceedings so that they shall not apply to ordinances passed for following purposes: Ordinances expressly required to be passed by general laws of state, or by provisions of act of assembly.

Ordinances for preservation of public peace, health, morals, safety and in the exercise of the police powers of the city government and for prevention and abatement of nuisances.

Any ordinance providing for election to increase indebtedness, and any other ordinance which by law must be submitted to an election before it becomes effective.

Ordinances for opening, paving, grading or improving streets when improvement is petitioned for majority in number or interest of abutting property holders.

Ordinances for construction of sewers, and for keeping streets, highways and sidewalks in proper repair.

MISCELLANEOUS

Smoke Suppression in Denver.

Denver, Colo.—The ordinance for the suppression of the smoke nuisance in the city and county of Denver has been unanimously approved by the city council. The ordinance creates a commission of five members, a deputy smoke inspector at a salary not to exceed \$1,200, and establishes municipal supervision of construction, reconstruction and operation of heat and power plants. The ordinance carries the emergency clause, and went into effect after immediate signing by the mayor. It is to be the duty of the smoke

abatement commission to serve in an advisory capacity to the building inspector, and to aid in a general way in obtaining the co-operation of owners of plants in the prevention of the smoke evil. The principal prohibitive clause of the measure makes it unlawful to allow the emission of smoke of a density in excess of 40 per cent, No. 2 Ringelmann scale, excepting during fifteen periods allowed for the cleaning of fire boxes. This prohibition applies to "power plants, locomotives and all other contrivances" which emit smoke. The feature of the ordinance, however, upon which the most dependence is placed in the matter of results in the requirement that no power plant shall be built or rebuilt without having first submitted full details to the building inspector and received a permit therefor. If any question arises over such plans, they will be taken up by the advisory board, who, with the smoke inspector, will determine upon recommendations. The commission of five members is to serve without pay, and is to be composed of three members who are practical engineers, one who is a substantial owner of real estate in the business district, and one who is a manufacturer. It has been pointed out by officials of the administration that the aim of enforcement will be educational rather than prohibitive.* The building inspector's department is being thoroughly equipped with modern boiler and furnace room testing devices; and where violations occur the co-operation of offenders will be the first attempt at correction. Building Inspector Frank M. Ladd believes that the best results can be accomplished by practical demonstration to owners of plants that smoke, besides being a nuisance, is an extravagance, and that the correction of a plant to avoid it means money saving, with more power and efficiency. The ordinance is, in the main essentials, the same as that proposed by the special committee of the Denver Civic and Commercial Association.

Municipal Vegetable Gardens.

Springfield, O.—Indorsing the proposition of a municipal garden for Springfield, the city commission has appropriated the sum of \$400 and authorized its expenditure as the city manager sees fit in planting and cultivating about six acres of ground near the water works pumping station. City manager Ashburner's plan as outlined before the commission contemplates the sale of the potatoes to the city hospital and city prison at cost, plus a small percentage additional charge to offset the city's initial outlay and cultivating expenses.

New York, N. Y.—The Board of Estimate has adopted a resolution looking to the registration of all vacant lands within the city limits and of persons willing to cultivate the land if it is turned over to them free. Upon the appointment of a committee by the mayor, owners of vacant land would be requested to submit offers of it. The Sinking Fund Commission was directed to supply the commission a list of all tracts of land owned by the city available for food production. A part of the resolution invites "the co-operation of the Federal and State Departments of Agriculture, the State and City Departments of Education, and other agencies in bringing about the best possible results in increasing the supply of food produce by the cultivation of vacant lands in the City of New York." Park commissioner Cabot Ward has opened a model farm garden in Union Square. There will be two plots, one 20 by 40 feet, suitable for commuters' back yards, and one 20 feet square, suitable for back-yard planting in the city. The commissioner hopes to show thousands how to utilize their back yards to increase the food supply. He has received offers of the use of several large vacant lots. Commissioner Ward will also give daily twenty-minute lectures on the tenth floor of the Municipal Building. Park Commissioner Ingersoll of Brooklyn has arranged to allow boy scouts to plant two acres in Prospect Park.

Fitchburg, Mass.—Forty acres of city owned land for gardening will be available for free use of Fitchburg people within a few weeks. Mayor Frank H. Foss has announced that arrangements for allotting garden plots to poor families and others who may want to grow their own vegetables have been practically completed. The municipal home gardens will be located in South Fitchburg on land

purchased by the city in connection with the sewage disposal plant. The land is not being used by the city, having been acquired for future needs as the growth of the city may demand further expansion of the disposal plant. Arthur H. Lowe, chairman of the sewerage commission, and David A. Hartwell, chief engineer, have approved of the plan. John Howarth, supervisor of school gardens and at the head of the public school agricultural department, will probably have personal charge of the gardens. The mayor proposes to have the land plowed at the expense of the city by one of the city departments, probably the department of streets and engineering, which has horses and men and which could borrow plows. The mayor is a strong supporter of the campaign launched by the state board of agriculture for utilization of vacant land throughout the state. He believes that the city should take the lead in encouraging home gardening, forward strides in which have been made by Mr. Howarth's department, this part of the school board extension work being so popular that about one thousand children are expected to take advantage of it this year. A part of the tract proposed for the municipal gardens was used for school gardens last year and good crops were raised there, the soil being reported to be fair. The tract is fairly level and little extra precaution would have to be taken, it is believed, to guard the gardens against vandalism or vegetable stealing because of the close proximity of the special policemen on duty night and day at the sewer plant.

Vote for Waterfront Improvements.

Milwaukee, Wis.—At the recent election the citizens voted in favor of a bond issue of \$200,000 for waterfront improvement work. The issue was carried by a majority of 1,889 votes. At the same time a plan to build a new natorium to cost \$70,000 was defeated by a majority of 1,100 votes.

Pier Collapse Decision Reaffirmed.

Long Beach, Cal.—The state supreme court has reaffirmed responsibility of the city of Long Beach for loss of life in a pier disaster there May 24, 1913, which has resulted in the filing of 87 suits asking for aggregate damages of \$3,500,000. The municipality asked for a rehearing following a decision of the court March 2 in the case of the heirs of one of the victims.

\$3,000,000 Civic Center and Housing Improvements.

Baltimore, Md.—Mayor Preston's suggestion of the submission of the loan of \$3,000,000, sanctioned by the legislature of 1908 but never submitted to the voters for ratification, has brought forward again the plans for a civic center outlined by John M. Carrere, Arnold W. Brunner and Frederick L. Olmsted, the well-known architects and city planners. All the improvements recommended by them would probably be made possible if the proposed bond issue be approved by the people. The architects came to Baltimore at the invitation and expense of the municipal art society. This organization, the commission on city planning and the committee which is in charge of plans to better housing conditions among the colored people of the city has been in consultation with the park board on the \$3,000,000 plan. It is provided in the loan act as passed that the interest and sinking fund financing of the loan shall be cared for out of the park board's funds should the mayor and the council decree this by ordinance. The original plans of the

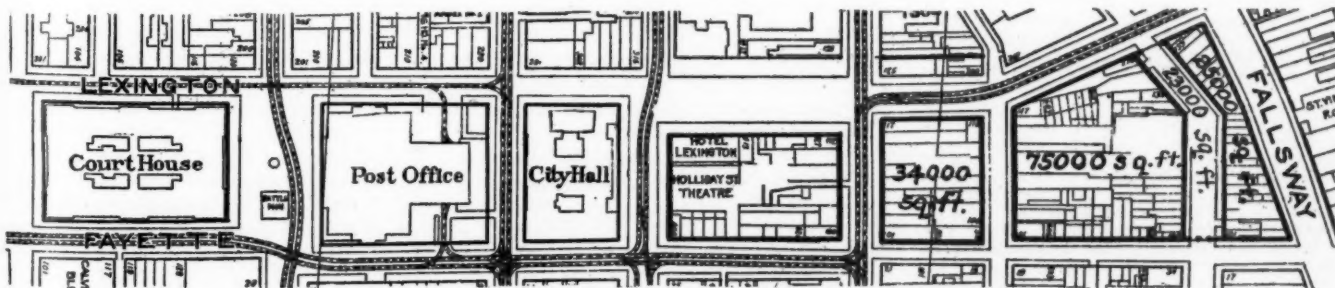
municipal art society include: Purchase by the city of all property between the city hall and the Fallsway and between Lexington and Fayette streets; the covering of Jones' Falls, provision being made for growing trees on each side and for parking with trees in the center; extension of Howard street as a parked street; sculpture garden and outside museum. Two of the squares east of the city hall were to be reserved as the site for public buildings. The Fallsway has been built, but there are no trees, as the parking provision calls for the acquisition of additional land, the cost of which was considered prohibitive. Mayor Preston is now purchasing land near city hall, but the site for the civic center has not been decided upon. The plans provide for a number of open spaces and the tearing down of a number of unsanitary houses in the colored section. City solicitor Field has informed Mayor Preston that an unexpended balance of \$324,500 from the \$1,000,000 loan used for the Jones' Falls work could be used for the civic center project. Meanwhile the city has won the first round in the fight over the legality of the ordinance for the civic center when its demurrer to the bill for an injunction filed in circuit court No. 2 by two taxpayers was sustained by judge Duffy. The complainants own property which the city endeavored to obtain under condemnation proceedings. They asked the court to restrain the city from carrying on these proceedings and to this the city demurred. The question was argued and it developed into a problem of jurisdiction as to whether the proper remedy should be through the law or equity court. It was principally upon this point of jurisdiction that the court upheld the plea of the city. The petitioners will file an appeal to the court of appeals for a final decision on the demurrer.

Lewiston's Municipal Coal Yard.

Lewiston, Me.—Former Mayor Brann has submitted the figures for the municipal coal yard and they show that the sales have amounted to \$16,581, and the expenses come within \$37 of that sum, giving a profit of some two cents on a ton; 1,716 tons of coal were sold on 3,018 ordered. Nearly \$3,000 came in to the public works department for trucking done on this coal. The yard opened New Year's day and was closed early in March.

City Planning in Cleveland.

Cleveland, O.—William Ganson Rose, the executive secretary of the city planning commission, has announced that it will be the policy of the commission to ask Cleveland experts to work on the city plan, and declared that it would make every effort to have actual work on projects carried out before the entire city plan is completed. "One of the chief aims of the city plan will be the elimination of waste," said Secretary Rose, "the waste of money, time and health." "Planning means preparedness and preparedness means progress," he said. A plan that would include all of Cuyahoga county has been suggested by Secretary Rose. He referred to the signing of the Fleming bill by Governor Cox, and declares lake front and river plans would be included in the work of the commission. Plans for the establishment of commercial and residence districts, the laying out of parks and civic centers, a traffic study and the locating of a market district also are to be included in the commission's activities.



SITE OF BALTIMORE'S PROPOSED CIVIC CENTER.

NEWS OF THE SOCIETIES

Calendar of Meetings.

April 17-20.—UNITED STATES GOOD ROADS ASSOCIATION. Annual convention, Birmingham, Ala. Secretary, J. A. Rountree, Birmingham.

April 18-22.—NATIONAL CONFERENCE ON COMMUNITY CENTERS. Annual conference, Chicago, Ill. Secretary, John Collier, 70 Fifth Ave., New York.

April 20, 21.—AMERICAN ACADEMY OF POLITICAL AND SOCIAL SCIENCE. Meeting, Philadelphia, Pa. Secretary, J. P. Lichtenberger, Philadelphia.

May 7-11.—AMERICAN WATERWORKS ASSOCIATION. Thirty-seventh annual convention, Richmond, Va. Secretary, J. M. Diven, 47 State Street, Troy, N. Y.

May 7-9.—NATIONAL CONFERENCE ON CITY PLANNING. Annual conference, Kansas City, Mo. Secretary, Flavio Shurtleff, 19 Congress Street, Boston, Mass.

May 8-10.—NATIONAL FIRE PROTECTION ASSOCIATION. Annual meeting, Washington, D. C. Secretary-treasurer, Franklin H. Wentworth, 87 Milk Street, Boston, Mass.

May 8-9.—AMERICAN ASSOCIATION FOR PROMOTING HYGIENE AND PUBLIC BATHS. Annual convention, Pittsburgh, Pa. Secretary, J. L. Mason, City Hall, Philadelphia, Pa.

May 28-June 1.—NATIONAL ELECTRIC LIGHT ASSOCIATION. Annual convention, Atlantic City, N. J. Secretary, T. Commerford Martin, 29 West 39th Street, New York, N. Y.

June 1-4.—AMERICAN ASSOCIATION OF MEDICAL MILK COMMISSIONERS. Annual meeting, Brooklyn, N. Y. Secretary, Dr. Otto F. Geier, Ortiz Building, Cincinnati, O.

June 4-5.—AMERICAN ACADEMY OF MEDICINE. Annual meeting, New York City. Secretary, Dr. Thomas W. Grayson, 1101 Westinghouse Building, Pittsburgh, Pa.

June 4-8.—AMERICAN MEDICAL ASSOCIATION. Annual meeting, New York City. Secretary, Frederick R. Green, 535 North Dearborn Street, Chicago, Ill.

June 6-13.—INTERNATIONAL ASSOCIATION OF POLICEWOMEN. Annual meeting, Pittsburgh, Pa. Secretary, Mrs. G. Sharrot, 40 Court House, Minneapolis, Minn.

June 6-13.—NATIONAL CONFERENCE OF CHARITIES AND CORRECTIONS, Pittsburgh, Pa. Secretary, Wm. T. Cross, 215 Plymouth Court, Chicago, Ill.

June 11.—NEW YORK STATE CONFERENCE OF MAYORS AND OTHER CITY OFFICIALS. Annual conference, Buffalo, N. Y. Secretary, W. P. Capes, 25 Washington Ave., Albany, N. Y.

June 13-15.—MARYLAND STATE FIREMEN'S ASSOCIATION. Twenty-fifth annual convention, Cumberland, Md. Secretary, William Weagly, Westminster, Md.

June 26-30.—AMERICAN SOCIETY FOR TESTING MATERIALS. Annual meeting, Atlantic City, N. J.

July 30-Aug. 3.—SOUTHERN SOCIOLOGICAL CONGRESS. Annual meeting, Blue Ridge, N. C. Secretary, J. E. McCulloch, 508 McLachlen Bldg., Washington, D. C.

Sept. 11-14.—NEW ENGLAND WATERWORKS ASSOCIATION. Annual convention, Hartford, Conn. Secretary, Willard Kent, 715 Tremont Temple, Boston, Mass.

Oct. 17-18.—LEAGUE OF MINNESOTA MUNICIPALITIES. Fifth annual convention, St. Cloud, Minn. Secretary-treasurer, Richard R. Price, University of Minnesota, Minneapolis.

Nov. 12-16.—AMERICAN SOCIETY OF MUNICIPAL IMPROVEMENTS. Annual convention, New Orleans, La. Secretary, Charles C. Brown, 469 Transportation Building, Chicago, Ill.

Nov. 20-23.—PLAYGROUND AND RECREATION ASSOCIATION OF AMERICA. Recreation Congress, Milwaukee, Wis. Secretary, H. S. Braucher, 1 Madison Ave., New York, N. Y.

American Institute of Electrical Engineers.

Five technical sessions have been decided on tentatively for the annual convention of the A. I. E. E., to be held at Hot Springs, Va., June 26-29. The convention will open on the afternoon of Tuesday, June 26, with president H. W. Buck's address, followed by reports of the various technical committees. The transmission and distribution committee will have charge of the two sessions on Wednesday. The morning will be devoted to the subject of high-tension cables. Three papers will be presented thereon as follows: "Certain Insulation Characteristics of High-Voltage Cables," by W. S. Clark and G. B. Shanklin; "Problems in Operation and Maintenance of Underground Cables," by John L. Harper; "Fundamentals of High-Tension Cable Joints," by D. W. Roper. The afternoon session will be devoted to high-tension insulators, and four papers will be delivered, as follows: "The Insulator Situation," by W. D. Peasley; "Porosity of Electrical Porcelain," by H. J. Ryan; "Expansion Effects as a Cause of Deterioration in Suspension-Type Insulators," by J. A. Brundige, and "Present Practice in the Design and Manufacture of High-Voltage Insulators," by A. O. Austin. The morning of Thursday, June 28, has been designated as the mining session and the following papers will be presented: "Forms of Power Best Suited for the Various Loads Encountered in the Operation of Bituminous Coal Mines," by R. L. Kingsland, and "Test of a Large Mine Hoist," by R. S. Sage. The fifth and last technical session, which will be a railway session, will be held Friday morning, June 29.

Minnesota Electrical Association.

The following officers were elected by the Minnesota Electrical Association for the coming year: President, Fred A. Otto; first vice-president, D. J. Fleming, Red Wing; secretary-treasurer, H. E. Young, Minneapolis; executive board: Fred A. Otto, St. Paul; R. M. Howard, Winona; H. E. Swanson, Rochester; T. C. Gordon, Little Falls, and H. E. Young, Minneapolis.

Alabama Good Roads Association.

At a recent meeting of the board of directors of the Alabama Good Roads Association, held in Birmingham, Ala., it was decided to pledge the support of the association to candidates for state offices who would work for the enactment of laws permitting the use of convict labor on the public roads of the state; the use of automobile licenses and taxes for the maintenance of roads; and for changing the state constitution so that state bonds may be issued for road construction. Officers were elected as follows: President, F. A. Gullledge, Verbena; secretary, W. F. Brown, Ragland; treasurer, Maj. J. B. Elliott, Birmingham.

Illuminating Engineering Society.

The annual convention of the Illuminating Engineering Society will be held in Newark, N. J., during the third or fourth week of September. P. S. Young, vice-president and treasurer of the Public Service Corporation, will be chairman of the committee on the 1917 convention. The committee on time and place, composed of the vice-presidents of the five sections, in conference with Mr. Young, will decide upon a definite date.

Preston S. Millar, chairman of the committee on papers, has reported to the council of the society that three papers have been scheduled definitely and several are under negotiation. Ten brief papers to form a symposium on color are listed.

A committee on diffusing media has been authorized, with I. G. Priest, associate physicist of the Bureau of Standards, as chairman.

Southwestern Electrical and Gas Association.

The thirteenth annual convention of the Southwestern Electrical and Gas Association will be held in the Adolphus Hotel, Dallas, Tex., on April 26, 27 and 28. The morning of the first day of the convention will be devoted to an address of welcome, the president's address, election of new members, the appointment of the convention committee and similar business. The sessions of the gas section will be held at the same time as the street and interurban railway sessions, but in separate rooms. The electric light and power sessions will be held on the afternoon of April 26 and the morning of the following day. The general session will be held early in the afternoon of April 27, followed by the business session, at which the reports of the treasurer and all committees will be presented and officers and standing committees for the coming year will be elected. One of the sessions of each committee will be devoted to practical operating subjects and the other session to executive and administrative matters and to matters of public policy.

American Institute of Electrical Engineers, Kansas Section.

The ninth annual electrical engineers' day was held at Kansas University March 28. The session was a meeting of the Kansas branch of the American Institute of Electrical Engineers. The meeting opened at 10.30 and continued all day. Norman Foster, senior engineer, presided over the meetings, which were opened by a talk from Dean P. F. Walker. He was followed by C. H. Taylor of an electrical firm in Kansas City. Mr. Taylor spoke on "Geared Turbine Units." C. R. Copp talked on "The Electric Propulsion of Ships."

In the afternoon Prof. H. P. Cady, of the university department of chemistry, opened the meeting with a lecture on "The Manufacture of Nitrogen from the Air." He was followed by J. T. Skinner, manager of the Lawrence street railway company, who spoke on "Public Utility Service." F. B. Uhrig,

manager of the Kansas City branch of the Western Electric company, talked on "The Progress of Electrical Development." The afternoon session closed with a motion picture in Fraser hall showing the Schenectady works of the General Electric Company.

After dinner A. S. Langsdorf, dean of the school of engineering at Washington University, St. Louis, Mo., spoke on "The Heating of Transformers."

PERSONALS

Flynn, Daniel, has been elected fire chief of East Syracuse, N. Y.

Governor Goodrich of Indiana has appointed as members of the new state highway commission Lorenzo H. Wright, Indianapolis, David C. Jenkins, Kokomo, and Haines Egbert, Goshen. The fourth member will be appointed soon.

PROBLEMS CITIES ARE STUDYING WITH EXPERTS

Stratford, Wis., is considering constructing WATERWORKS. The engineer is W. G. Kirchoffer, Madison, Wis.

A WATER SYSTEM is to be built by Berthold, N. D., from plans prepared by T. R. Arnold, Great Falls, Mont.

Sumner, Ia., is to make some PAVING IMPROVEMENTS, plans having been completed by C. H. Currie, Webster City, Ia.

A SEWAGE DISPOSAL PLANT is to be constructed by Bedford, Ia., from plans prepared by Theo. S. DeLay, Lichty building, Creston, Ia.

In negotiating the terms under which it will take over the operation of the STREET RAILWAYS, Toledo, O., has the consulting services of Thomas L. Sidlo, Cleveland, O.

Grand Mound, Ia., is to construct SEWERS and a DISPOSAL PLANT following the preparation of plans by the Iowa Engineering Co., Chase building, Clinton, Ia.

A SEWERAGE SYSTEM and DISPOSAL PLANT, to cost \$225,000, are proposed for Rockland, Mass. The engineer is W. Worthington, Dedham, Mass.

Hillsboro, Ill., is to make a number of PAVING IMPROVEMENTS, for which plans are being prepared by the Warren Engineering Co., Powers building, Decatur, Ill.

Geuda Springs, Kans., is to construct WATER SUPPLY and SEWERAGE SYSTEMS. Plans and specifications were the work of the Benham Engineering Co., Colcord building, Oklahoma City, Okla.

Colfax, La., is to take over the property of the local LIGHT & POWER PLANT and make extensive improvements. Xavier A. Kramer, Magnolia, Miss., is consulting engineer for the project.

An outfall SEWER SYSTEM is to be constructed by Santa Barbara, Cal. The plans, approved by the state board of health, were prepared by Olmsted & Gillelen, Hollinsworth building, Los Angeles, Cal.

A SEWERAGE SYSTEM and DISPOSAL PLANT are to be built by Paulsboro, N. J., from plans prepared by Remington & Vosbury, 6th and Market streets, Camden, N. J.

Griffin, Ga., is to pave a number of STREETS. The engineers are Solomon-Norcross Co., Atlanta, Ga.

STREET IMPROVEMENTS are to be made by Marianna, Ark., from plans prepared by Herring & Schellhaus, Forrest City, Ark.

Yates Center, Kans., is to improve its WATERWORKS. Bonds have been voted and preliminary plans have been prepared by Black & Veatch, 507 Interstate building, Kansas City, Mo.

In making improvements to its WATERWORKS, Lansing, Mich., has the consulting engineering services of Esselstyn & Murphy, 206 New Telegraph building, Detroit, Mich.

Morrillton, Ark., is to construct a \$150,000 BRIDGE. Plans are being completed by the engineers, Harrington, Howard & Ash, Orear-Leslie building, Kansas City, Mo.

A \$1,000,000 BRIDGE is to be erected over the Lehigh river between Bethlehem and South Bethlehem, Pa. Clarence W. Hudson, 45 Broadway, New York, N. Y., has been retained as consulting engineer.

Two reinforced CONCRETE BRIDGES to be constructed by Wayne county, Ind. The consulting engineer is John W. Mueller, Palladium building, Richmond, Ind.

WATERWORKS and a SEWER SYSTEM are proposed improvements for Huntsville, Mo. The engineers for the work are E. T. Archer & Co., 514 New England building, Kansas City, Mo.

The city of Utica, N. Y., has been considering a number of PARK IMPROVEMENTS and has been in consultation with Miss Emily M. Gibson, landscape architect, Utica, who has just submitted a report.

New Toronto, Ont., is to install new equipment in its WATERWORKS. Plans and specifications were prepared by the consulting engineers, James, Loudon & Hertzberg, Ltd., 36 Toronto street, Toronto, Ont.

The question of GARBAGE COLLECTION is being studied by Canton, O. The city has retained to make a survey R. Winthrop Pratt, Cleveland, O., the engineer who designed and supervised the construction of the city's new garbage disposal plant.

Hinkle, William, has been re-elected chief of the Canastota, N. Y., fire department.

Scofield, Horace G., for 37 years city engineer of Bridgeport, Conn., died at his home in that city on April 9. He was 86 years old and retired from the city engineering work in 1903.

Whitford, Reid, has resigned as secretary and engineer of the Charleston County (S. C.) Sanitary and Drainage Commission.

A number of changes have been made in the engineering department of the city of Gary, Ind. W. J. Fulton has been promoted from the position of city engineer to that of president of the board of public works and W. P. Cottingham, former assistant engineer, is promoted to his place. Mr. Cottingham has been assistant for the past three years in charge of street and alley construction and maintenance. He was formerly city engineer for two years of Toppenish, Wash., and is a civil engineering graduate from the University of Minnesota. H. E. Jordan has been transferred from assistant engineer to superintendent of parks; O. B. Canaday becomes assistant engineer and Ray D. Hammons is transferred from the position of chief draftsman to assistant city engineer.

Following mayors have been elected in Iowa: Albia—H. S. Berry. Anamosa—J. E. Tyler. Atlantic—J. Burnea. Belle Plaine—John Zellers. Boone—D. G. Baker. Brunsville—Job Kennedy. Clarinda—Dr. A. M. Sherman. Cedar Falls—J. B. Newman. Centerville—W. S. Cox. Chariton—H. G. Larimer. Charles City—Wesley Henke. Cherokee—A. R. Molyneux. Darby—J. J. George. Dike—H. J. Knudson. Fairfield—Ralph Munro. Fort Dodge—John F. Ford. Grinnell—Dan White. Hampton—C. T. McCrellis. Indianola—J. N. Weldin. Iowa City—F. K. Stebbins. Jefferson—F. J. Forbes. Kiron—J. E. Hoadlund. Knoxville—E. H. Gamble. LeMars—George McLean. Manchester—F. H. Munsen. Manly—A. Dobel. Maquoketa—W. C. Mordes. Marion—C. A. Patten. Mason City—T. A. Potter. Newton—J. Findley. Coon. Oelwein—T. L. Hanson. Osceola—E. Paul. Oskaloosa—J. G. Harold. Ottumwa—Pat Leeny. Perry—Jack Bruce. Red Oak—F. A. Smith. Stuart—R. J. McKee. Tama—P. Hixon. Toledo—S. B. Stiger. Vinton—F. J. Allen. Waukon—George W. Duyweaton. Waverly—F. A. Osincup.

The following officials have been elected in Texas:

Decatur—Mayor, D. J. Moss; Aldermen, Glenn Russell, J. P. Lynch and S. M. Gosse.

Ennis—W. D. Farris was re-elected mayor.

Belton—Mayor, Neal Bassel; aldermen, Oscar Lusk, T. H. Birdwell and J. H. Burnett.

Rosebud—Mayor, D. A. Booth; E. E. Porter, city attorney; E. C. Parker and F. Buggin, aldermen.

Grand Prairie—Mayor, L. O. Turner; city marshal, W. T. King; aldermen,

(Continued on page 574.)

NEW APPLIANCES

Describing New Machinery, Apparatus, Materials and Methods and Recent Interesting Installations.

DUPLEX TRUCK.

Three and One-half-Ton Four-Wheel Drive for Difficult Hauling.

The basic feature of design of the Duplex truck, which makes it particularly adapted to difficult hauling, is the even application of motor power to all four wheels through the four-wheel drive. The front wheels pull with as much driving power as the rear wheels give with their push. The Duplex internal gear type of drive delivers the motor's power directly to the wheels at a point near their rims. The Duplex chain case gives it a large reserve power. The power of 64 crankshaft turns is obtained to each revolution of a drive-wheel—a power impulse from the motor for every two inches of wheel travel. The result is, it is claimed, that four times the usual pulling power is obtained, and the truck can go through difficult snow, sand or loose loam, up steep grades and bad roads, and can draw two or three loaded trailers.

The entire truck and load weight in the Duplex is carried on "dead" axles front and rear. These are 100 per cent oversize. A second or "live" axle transmits the power from propeller shafts to wheels. It is entirely relieved of the weight load. In addition to this, the Duplex internal drive gear eliminates 75 per cent of the strain borne by the axles in the hub shaft drive. This means simplification throughout the whole design, reduction in weight and consequent economy in tire-wear, maintenance and gasoline.

Power is carried on the main shaft from the motor through the disk clutch and three speed transmission to the chain case. Here it is transferred by a silent chain belt to the propellers,

which turn the front and rear live axles. The strong, simple spur gear meshes with the ring gear attached to the drive wheel, applying the driving leverage near the rim of the wheel,



EDISON-LA FRANCE SEARCHLIGHT.

where it reaches the greatest efficiency. The driving mechanism is similar front and rear. No torsion rods are required under the axles, as the driving axle is relieved of most of the strain borne in the shaft drive. Radius rods are used in Duplex construction to provide extra reserve of strength. Besides giving increased leverage through the application of power nearer the rim, and relief on the axles, the use of the Duplex internal gear gives extra road clearance so that the truck can pick its way over a cluttered path or deep ruts.

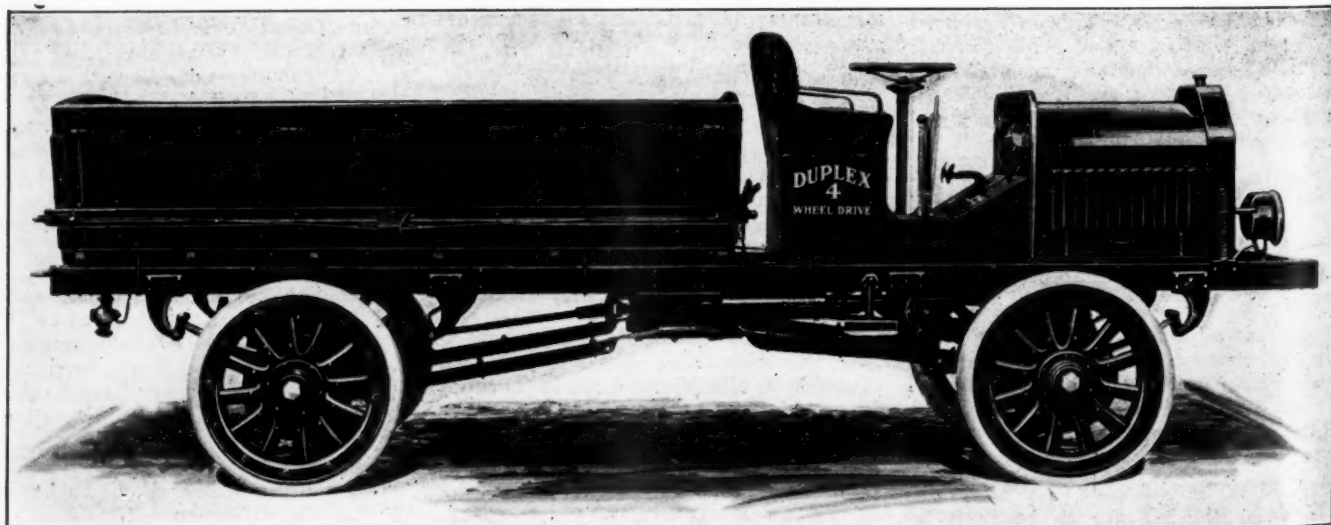
The Duplex Adler automatic self-

locking differential is not of the usual complicated gear type, which often allows the diversion of power from the opposite drive wheel when a wheel strikes a slippery spot, and thus causes stalling. The Duplex Adler differential consists only of a half dozen small strong working parts, without any gear. It allows of necessary play between the wheels, but when one wheel slips the differential automatically and positively throws the entire power over to the wheel on the opposite side, which still has road traction. So long as any one of the four drive wheels of the Duplex can find traction, the truck cannot be stalled and it may be extricated, with a full load, from a situation where three of the wheels are helpless.

The chain case not only transmits the power, but, by means of a second, or reserve, chain with sprockets, provides an extra 2 to 1 gear reduction. This allows practically of doubling the power on the wheels.

The application of power to all four wheels also permits of a positive brake action working simultaneously on all four wheels. The service, or foot brake, contracts on the main propeller shaft evenly and smoothly at the rear end of the chain case. It slows the whole driving mechanism surely and without jerking. The emergency or hand brake grips the front and rear propeller shafts in a positive smooth action.

The Duplex spring suspension, with shackles at each end, contributes to long life, ease of control and strength. Both springs are 43 inches long, semi-elliptic, and the shackle bolts are lubricated by grease cups. The frame is of pressed steel channels, firmly held at corners by gussets of boiler steel.



DUPLEX FOUR-WHEEL DRIVE 3 1/2-TON TRUCK.

It is 18½ feet long, balanced, and reinforced by four strong cross members. The rear end and draw bar coupling are specially designed for the wrenching strains of drawing trailers or road making equipment. The wheels are of the artillery type, hickory, with 12 spokes, malleable iron hubs and Bowen roller bearings.

The steering gear is of the Lavine irreversible worm type. It is so designed that slack can be taken up quickly and with only an ordinary wrench. Steering is easy and driving without excessive fatigue. The turning radius is 30 feet.

Motor, clutch and transmission are built in a unit. The motor is a four-cylinder 40 h. p. Buda, specially designed for this type of duty. It is claimed to be simple, powerful, accessible and long lasting. It is hung by a three-point suspension. The cylinders are cast en bloc, with a 4¼-inch bore and a 5½-inch stroke. Lubri-

light was brought forcibly to Mr. Thomas A. Edison's attention. After considerable time spent in experimental and development work, the new Edison-LaFrance searchlight was produced. The American-LaFrance Fire Engine Company, Inc., was chosen to manufacture and market this invention.

Although designed primarily for fire department work, these searchlights should also prove of immense value in the present crisis for protective lighting of bridges, reservoirs and public buildings. They also fill a long felt want in the industrial field as they furnish abundant light whenever needed without the inconvenience of stringing temporary wires. They can be used for night construction work, wrecking work and similar service. In rush work where bonuses or fines are at stake these searchlights should be money-savers to contractors.

The principal features upon which claims for unusual merit are based are:

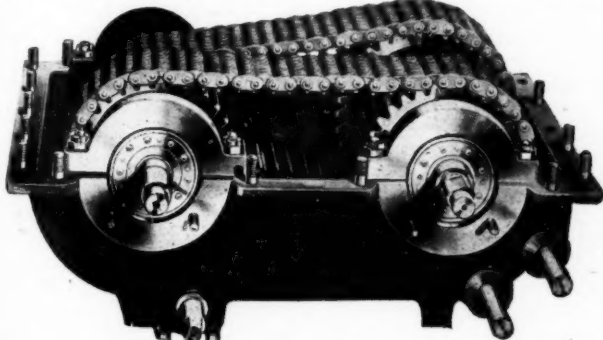
the simplest kind of care and attention; a maintenance cost so low as to be almost negligible.

This light is claimed to be absolutely safe, exceptionally efficient and economical. The main idea throughout has been to design a practical, general duty light with a sufficient capacity to be of real benefit when needed, of sturdy construction to withstand rough usage and to represent the acme of simplicity.

The accompanying illustration shows the searchlight, which is being sold by the American-LaFrance Fire Engine Company, Inc., Elmira, N. Y.

INDUSTRIAL NEWS

Cast Iron Pipe.—Chicago—Lettings have been almost nil recently. Hammond, Ind., awarded 400 tons to the American Cast Iron Pipe Company. On April 16 Winnipeg, Man., awarded the contract for 5,000 tons of water pipe, a proposition which has been up for some time. Quotations: 4-inch, \$53.50; 6-inch and larger, \$50.50, with \$1 extra for class A. Birmingham—In spite of the further advances in pipe, the fill-in and immediate necessity orders, combined with large contracts not yet completed, keep plants going to approximate capacity. Quotations: 4-inch, \$48; 6-inch and upward, \$45, with \$1 added for special lengths. New York—Bayonne, N. J., has opened bids on about 500 tons of 8 to 20 inches. No other public lettings of importance are announced. Quite a number of municipalities in New England are getting bids on small quantities and the demand from private buyers continues excellent. Prices are firm, with 6-inch,



DUPLIX
CHAIN CASE
WITH THE
RESERVE CHAIN.

cation is force feed and splash, a plunger pump carrying the oil to the main bearings and timing gears; the constant level splash system, throwing oil to the cylinder wells. Valves are of tungsten steel, unusually accessible for grinding and cleaning. Connecting rods are heat treated drop forgings. Crank shaft is drop forged open hearth steel, heat treated and ground. An Eiseman high tension magneto supplies the current for the ignition. There are no batteries. The Schebler carburetor is used. A dash air control is provided for driver's convenience. The Duplex cooling system consists of a round, vertical tube radiator and a gear driven centrifugal pump. The transmission is the positive clutch type, three speeds forward and reserve. The clutch is of the multiple dry disk type. The Stewart vacuum gasoline feed system is used.

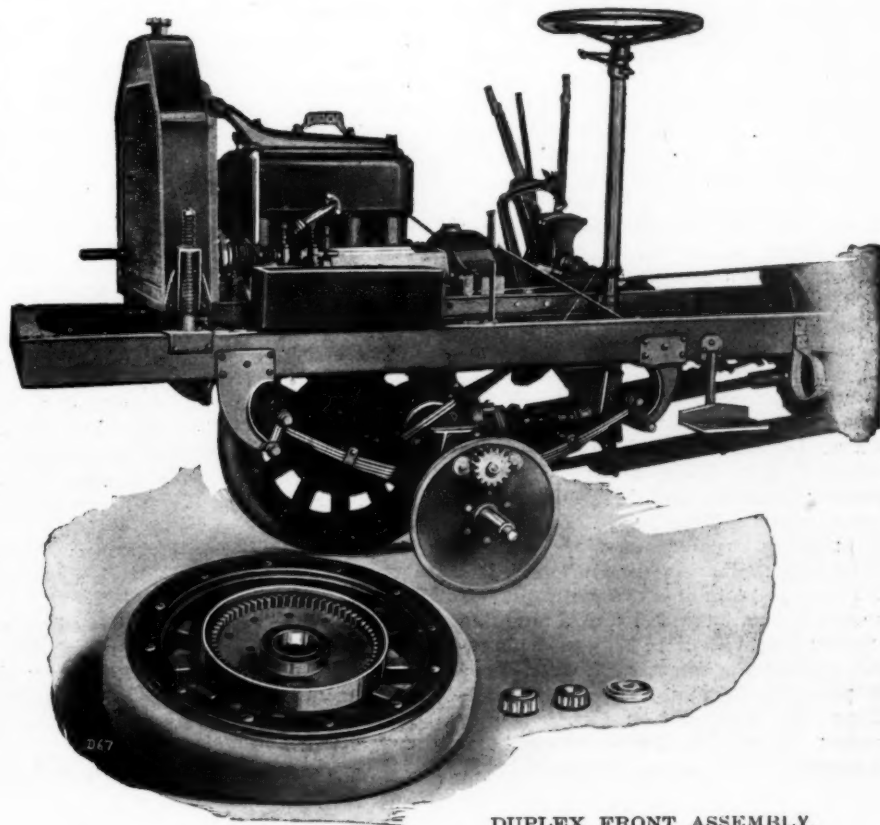
The accompanying illustrations show the chain case, the front end chassis assembly, including wheel gears, and the truck itself. It is made by the Duplex Truck Company, Lansing, Mich.

EDISON-LA FRANCE SEARCH-LIGHT.

New Light for Fire-Fighting and Other Services.

During the destruction of the Edison Phonograph Works by fire in December, 1914, the difficulty experienced in fire-fighting and salvage work through lack of adequate smoke-penetrating

The quantity and brilliancy of light produced from a self-contained, easily carried outfit; the powerful, light weight storage battery with steel jars securely welded in all seams, practically indestructible and that require only



DUPLIX FRONT ASSEMBLY.

class B and heavier, quoted at \$50.50; class A taking the usual extra of \$1 per ton.

Lead.—Lead is quiet and unchanged. Quotations: New York, 9.35 cents; St. Louis, 9.15 cents.

The Clay Pipe Book for 1917 is the latest publication of the **International Clay Products Bureau**, Kansas City, Mo. The advantages of the use of vitrified clay pipe and the products are convincingly described and interestingly illustrated. The forty pages of the booklet are packed with much interesting and handy information, and the whole range of manufacture and use of vitrified clay is covered. Among the subjects discussed are: Tests; costs of sewers; culverts; dams; sewer design; drainage systems, purposes and designs; pipe foundations; coefficient of friction for sewers and drains; split pipe for gutters; insulation pipes; pipe laying methods; pier casings; segment blocks; bearing strength of pipe; velocity of flow, and well casings.

The **Portland Cement Association**, 111 West Washington street, Chicago, Ill., announces that owing to international complications and the consequent state of internal affairs that are likely to follow, the spring meeting of the association, which was to be held in San Francisco, April 16-18, inclusive, has been postponed indefinitely. The Kansas City office of the association has moved from the Commerce building to the Rialto building.

The **American-LaFrance Fire Engine Company, Inc.**, Elmira, N. Y., announces receipt of the following orders:

Baltimore Co., Md., 1-Type 75 pumping engine; Battle Creek, Mich., 1-Type 12 pumping engine; Charles City, Iowa, 1-Type 40 combination with Junior pump; Cohoes, N. Y., 1-Type 75 pumping engine; Cohoes, N. Y., 1-Type 40 combination chemical engine and hose car; Elmira, N. Y., 1-Type 12 combination service truck; Elmira, N. Y., 1-Type 75 pumping engine; Groton, Conn., 1-Type 12 pumping engine; Glen Cove, L. I., N. Y., 1-Type 75 pumping engine; Glen Cove, L. I., N. Y., 1-Type 14 combination service truck; Harrisburg, Pa., 1-type 31 tractor; Hartford, Conn., 1-Type 75 pumping engine; Lockport, N. Y., 1-Type 75 pumping engine; Lockport, N. Y., 1-Type 31 truck tractor; Marblehead, Mass., 1-Type 14 combination service truck; Ogden, Utah, 1-Type 31 truck tractor; Oakland, Cal., 1-Type 10 piston pump engine; Oswego, N. Y., 1-Type 12 pumping engine; Oswego, N. Y., 1-Type 12 combination; Phoenixville, Pa., 1-Type 12 combination with Junior pump; Provo, Utah, 1-Type 75 pumping engine; Pottsville, Pa., 1-Type 75 pumping engine; Portchester, N. Y., 1-Type 40 pumping engine; Rawlins, Wyo., 1-Type 40 combination with Junior pump; Tracy, Cal., 1-type 40 combination with Junior pump; Union Hill, N.

J., 1-Type 31 75-foot aero truck; West Berwick, Pa., 1-Type 40 pumping engine and hose car; White Plains, N. Y., 1-Type 31 truck tractor; West Park, Ohio, 1-Type 75 pumping engine and hose car.

The **Iroquois Works** (Buffalo, N. Y.) of the **Barber Asphalt Paving Company** has just published a new bulletin, No. 5, on "Iroquois Asphalt Repair Wagon." The wagon is designed to fill a growing demand for a small, efficient and inexpensive outfit for repairing asphalt pavements. The bulletin illustrates and describes in detail the new wagon, five and ten gallon portable kettles and tools for patching outfits.

Standard Widths for Wagon Tires.

As the result of a long series of traction tests on earth and gravel roads, the U. S. Department of Agriculture recommends that the following widths of tire be adopted generally by manufacturers for wagons of different carrying capacities:

Type of Wagon.	Gross Width Weight of Loaded. Tire.	
	Lbs.	In.
1-horse wagon.....	2,000	2
Light 2-horse wagon....	3,500	2½
Medium 2-horse wagon..	4,500	3
Standard 2-horse wagon..	6,800	4
Heavy 2-horse wagon....	7,500	5

These five types, says the circular, should be sufficient to meet all the needs of farming operations and general work, except the heaviest trucking and certain specialized hauling which is likely to be confined to city pavements. The circular recommends, therefore, that a name be adopted for each of these sizes and that the wagons be designated not by the size of skein, but according to their gross load capacity. The gross carrying capacity of the wagon should be drawn, it is said, by stencil or plate on the back of the rear axle. The size of skein for the five types of wagon named vary, says the circular, from 2½ or 2¾ inches for a 1-horse wagon to 3½ inches for the heavy 2-horse wagon.

PERSONALS

(Continued from page 571.)

Less Tinsley, K. A. Ward, Noah Turner and D. A. Bradshaw.

Mount Vernon—M. Seercher, J. L. Rutherford, Jr., and G. E. Title, aldermen; B. O. Shurtleff, City Attorney.

Mineral Wells—L. E. Cowling, mayor; K. McBrayer re-elected water commissioner.

Snyder—E. F. Smith, mayor; F. V. Clark, R. E. Cox, T. J. Blackburn and Joe Caton, aldermen.

Rice—G. W. Harper re-elected mayor and W. D. Bartlett city marshal.

Corsicana—J. L. Halbert, mayor; S. Scarborough, attorney; G. W. Boyd, tax assessor. A commission to frame a new charter was elected.

Greenville—S. R. Polk, chief of po-

lice; C. G. Wilson, city clerk; T. D. Starnes, city attorney.

Grand Saline—B. Maupin, mayor.

McKinney—H. A. Finch re-elected mayor and Sam J. Massie and Joe W. Barnes re-elected commissioners.

Abilene—Mayor, E. N. Kirby, re-elected.

Calvert—B. R. Reid, mayor, and Scott Field, Jr., and M. P. Sneed, commissioners.

Irving—C. E. Miller, mayor; Dr. J. W. Roberts and Ury Morris were elected commissioners.

Georgetown—Aldermen elected are: W. H. Davis, M. R. Mood and D. K. Wilcox.

Denton—O. M. Curtis and W. M. Taliaferro, city commissioners.

Temple—Wiley V. Fisher, city marshal; W. S. Lemley, city attorney; J. Taylor Martin, city secretary and tax collector; T. J. Laramie, J. C. Puett and John J. McFadden, aldermen.

Comanche—Mayor, J. R. Eanes; city secretary, W. L. Reeves; treasurer, W. H. Davis; attorney, J. P. Graham; recorder, G. S. Walker; marshal, W. W. Cox; aldermen, Hugh Lacy, G. W. Jessup and H. C. Rambo.

Gainesville—J. Z. Keel re-elected mayor.

Rogers—Dr. R. R. Custis, mayor; A. W. Bonds, city marshal; W. B. Thomas, treasurer; R. B. McElroy, secretary; H. H. Barnard, H. T. Ashcraft, W. B. Priddy, J. W. Morgan and W. H. Gregory, aldermen.

Terrell—T. C. Russell and Joe La Roc, commissioners.

Sherman—T. U. Cole, re-elected mayor; P. R. Markham, C. C. Mayhew, R. A. O'Bannon, W. W. Rodgers, C. A. Sanford, J. A. Simmons, S. W. Gladney and W. H. Lucas.

Carrollton—G. B. Chastain, mayor; aldermen, C. A. Miller, Andrew Jackson, C. E. Baxley, C. L. Chastain and H. L. Guinn.

Denison—Flem G. Coleman, mayor; Jess E. Whitehurst, commissioner.

Texarkana—Dr. K. M. Kelly, mayor; Ed Hanna, Otto Moore, C. M. Robertson and J. W. Maguire, aldermen.

Winnsboro—O. M. Thomas re-elected mayor.

Cleburne—J. J. Rogers, re-elected city marshal; W. E. Myers, re-elected city attorney; J. Harry Stanford, re-elected tax assessor and collector; J. R. Wallis and F. D. Dickson, re-elected water commissioners; Dr. A. D. Ray and John H. Short, aldermen.

Lampasas—L. R. Sparks, re-elected mayor and M. W. Howard, J. A. Hallmark and Mark Alexander, aldermen.

Hillsboro—Mayor, W. H. Knight; marshal, J. A. Palmer; assessor and collector, T. M. Johnson; aldermen, T. T. Moore and C. G. Denman.

Whitney—E. Rice, mayor, and J. N. Collier, W. S. Ford, Jim Hill, A. D. Rhea and P. J. Sherman, aldermen; A. Marsh, marshal.

Italy—Mayor, Jesse M. Parker; marshal, T. F. Crayton; secretary, Horace Gilliam; aldermen, P. H. Martin, Jodie Whitt and J. N. Perkins.

ADVANCE CONTRACT NEWS

ADVANCE INFORMATION BIDS ASKED FOR

CONTRACTS AWARDED ITEMIZED PRICES

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also correction of any errors discovered.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREETS AND ROADS.				
O.	Marietta	Apr. 20.	Grading roads	C. M. Weeks, Engr.
N. Y.	New York	2 p.m., Apr. 20.	Paving with sheet asph. and gran. block on many sts.	M. M. Marks, Boro Pres.
Wash.	Chehalls	Apr. 20.	2.5 miles concrete pavement	J. D. Neville, Co. Engr.
N. C.	Beaufort	4 p.m., Apr. 20.	10 miles cement sidewalks	G. C. White, Engr., Durham
Wis.	Waukesha	2 p.m., Apr. 20.	Macadamizing streets	Board of Public Works
Wis.	De Pere	10 a.m., Apr. 20.	25,314 sq. yds. pavement and 15,825 feet of combined curb and gutter	W. H. Crosson, City Engr.
Mich.	Ontonagon	2 p.m., Apr. 20.	Grading 15 miles and macadamizing 10 miles	J. K. Morton, Engr.
N. C.	Elkins	Apr. 20.	10,000 yds. paving and 2,800 ft. curb and gutter; 1,110 ft. granite curb	City Clerk
N. J.	Trenton	2:30 p.m., Apr. 20.	Relaying Belgian block pavement	City Engr.
Pa.	Philadelphia	Apr. 20.	Paving with asphalt, brick, wood and granite block, concrete and bituminous concrete and macadam	W. H. Connell, Chief, Bureau of Highways
Pa.	Erie	10:30 a.m., Apr. 20.	Grading, curbing and paving several streets	F. G. Lynch, City Engr.
Pa.	Easton	10 a.m., Apr. 20.	Furnishing crushed stone, screenings, sand, gravel, slag, oil and Amiesite	G. P. Young, Co. Comptroller
Wash.	Garfield	8 p.m., Apr. 20.	Grading and concrete walks; \$20,000 available	E. G. Faires, Town Clerk
Wis.	Tomah	noon, Apr. 21.	Concrete pavement and curb and gutter	A. R. Garnock, Engr., Eau Claire
Ore.	St. Helens	2 p.m., Apr. 21.	8,577 sq. yds. concrete, bitulithic or asphalt concrete; 3,000 cu. yds. excavation	H. T. Abry, Co. Rd. Master
Ind.	Greencastle	11 a.m., Apr. 21.	16,000 feet Rocmac and 20,000 feet gravel and macadam	J. M. Allen, Co. Aud.
La.	St. Louis City	Apr. 21.	20,000 sq. yds. concrete pavement	T. H. Johnson, City Engr.
Ind.	New Albany	10 a.m., Apr. 21.	7,700 feet road work	Emile Dupaqueur, Co. Aud.
Ind.	Terre Haute	11 a.m., Apr. 21.	3 gravel roads	Thomas Ferguson, Co. Aud.
Minn.	Morris	10 a.m., Apr. 21.	Constructing state highways	C. R. Wolltham, Co. Audr.
Minn.	Morris	10 a.m., Apr. 21.	Grading and graveling one mile	S. A. Siverts, Jr., City Mgr.
O.	Maple Heights	noon, Apr. 23.	Sidewalks on several streets	Ralph Hecker, Engr., Leader-News Bldg., Cleveland
Fla.	Pensacola	11 a.m., Apr. 23.	Constructing fill and concrete pavement	Bur. of Yards & Docks, Wash.
Pa.	Wilkes-Barre	2 p.m., Apr. 23.	3.25 miles Pittston road. Plans, \$10.	Rd. & Bridge Dept., Crt H'se.
Pa.	S. Bethlehem	8 p.m., Apr. 23.	75,000 sq. yds. first-class pavement	R. M. Brady, Boro. Engr.
Minn.	Stillwater	Apr. 23.	Elevating road grader	N. A. Nelson, Co. Aud.
Wis.	Green Bay	Apr. 23.	Paving streets	City Engr.
Md.	Cumberland	9:30 a.m., Apr. 23.	23,600 sq. yds. concrete, 6,100 yds. brick and 930 yds. wood block paving; 14,400 feet concrete curb	R. L. Riser, City Engr.
Cal.	Los Angeles	2 p.m., Apr. 23.	Grading and constructing concrete curbs	H. J. Leland, Co. Clerk
Wash.	Pomeroy	8 p.m., Apr. 23.	13,800 sq. yds. hard surface pavement, 11,450 feet gutter and 5,250 cu. yds. excavation	Harry St George, City Clerk
W. Va.	New Cumberland	Apr. 23.	Paving with brick, \$125,000 available	C. E. Grafton, Co. Rd Engr.
N. C.	Newbern	Apr. 23.	Paving 50 miles of highways with brick	Bd. of Co. Commrs.
O.	Maple Heights	Noon, Apr. 23.	Sidewalks on several streets	C. G. Holtz, Village Clerk
O.	Lockland	noon, Apr. 23.	Monolithic brick paving and concrete curb and gutter; cost, \$22,650	City Engr.
Ind.	Woodruff Place	8 p.m., Apr. 23.	Improving alleys	Jeup & Moore, Engrs., Indiana Trust Bldg., Indianapolis
Kans.	Lawrence	10 a.m., Apr. 23.	23,800 sq. yds. brick, coner. or asph. coner. curbing, etc.	City Engr.
Ore.	Astoria	2 p.m., Apr. 24.	4,000 sq. yds. coner. walk, 21,000 sq. yds. first-class pavt., 9,200 ft. curb, and 50,000 cu. yds. excavation	G. T. McLean, City Engr.
O.	Cincinnati	Noon, Apr. 24.	Brick paving, curbs, etc.	Chief Engr., Dept. Pub. Serv.
Va.	Franklin	Apr. 24.	3,500 sq. yds. paving, cost \$13,000	P. R. Camp
Ind.	South Bend	10 a.m., Apr. 24.	Paving four streets and alleys	Board of Public Works
Pa.	Pittsburgh	Noon, Apr. 24.	Wood block floor on 10 bridges	J. G. Chalfant, Co. Engr.
Conn.	Hartford	11 a.m., Apr. 24.	Laying about 60,000 sq. yds. asphalt and granite block	Board of Contract & Supply
Md.	Baltimore	Noon, Apr. 24.	Maintaining 35.5 miles road in Calvert Co.	State Roads Commission
Pa.	Wilkes-Barre	Noon, Apr. 24.	Furnishing 30,000 gallons of road oil	M. C. Murray, Supt. Streets and Public Improvements
Ky.	Hindman	Apr. 24.	3 miles road work	County Clerk
Va.	Franklin	Apr. 24.	3,500 sq. yds. pavement and 1 mile gravel road	Anderson & Christie, Engrs., Charlotte, N. C.
O.	Toledo	Apr. 24.	Three-quarter mile macadam road	Gabe Cooper, Co. Aud.
Minn.	Blue Earth	1 p.m., Apr. 25.	20 miles of earth road, including 98,000 cu. yds. grading, culverts, etc.	J. L. Herring, Co. Aud.
Ky.	Pikeville	Apr. 25.	5 miles road work	County Clerk
O.	Alexandria	noon, Apr. 25.	Brick pavement with mastic filler	W. H. Proctor, City Clerk
Ky.	Prestonsburg	Apr. 25.	6 miles county road	County Clerk
W. Va.	Fairmont	noon, Apr. 25.	22 miles of road work	W. M. Linn, Court House
O.	Greenville	Noon, Apr. 25.	Brick, wood or bitulithic pavement	R. K. Horn, City Engr.
O.	Cleveland	Noon, Apr. 25.	Repaving and curbing 8 streets	Commr. Engineering
Wis.	Clintonville	8 p.m., Apr. 25.	Paving and improving several streets	Street Comr.
N. Y.	New York	3 p.m., Apr. 26.	11,400 gallons of tar and trap rock	Dept. Parks, Brooklyn
Va.	Roanoke	Noon, Apr. 26.	Granolithic sidewalks	F. L. Gibboney, City Engr.
N. J.	Newark	3:30 p.m., Apr. 26.	Repaving and paving streets with asphalt and wood and granite block	M. R. Sherrard, Chief Engr.
O.	Mt. Gilead	Apr. 26.	Constructing concrete and other roads, cost \$188,000	Co. Comrs.
Ind.	Winchester	10 a.m., Apr. 26.	Constructing 2 stone roads	C. E. Tillson, Co. Aud.
N. Y.	New York	10:30 a.m., Apr. 26.	Paving and repaving with sheet asphalt and granite block	Douglas Mathewson, Borough Pres., Bronx Borough
O.	Beallsville	noon, Apr. 27.	Grading, brick paving, curbing and sewers	C. Davis, Village Clerk
W. Va.	Clarksburg	Apr. 27.	6.1 miles brick, concrete or asphalt roads	G. M. Harbert, Co. Rd. Engr.
Ind.	South Bend	10 a.m., Apr. 27.	Paving several streets	Board of Public Works
O.	Marion	Apr. 27.	30,000 sq. yds. street paving	Ed. S. Ault, City Engr.
Ind.	Warsaw	10 a.m., Apr. 28.	Constructing gravel roads	V. D. Mock, Co. Aud.
Mich.	Ishpeming	3 p.m., Apr. 28.	3 miles grading and graveling; 0.86 miles macadam road; resurfacing 3.5 miles macadam; bridges	K. I. Sawyer, Co. Road Supt.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Ala.	Grove's Hill.....	Apr. 30..	Graveling 7.5 miles of road.....	County Engr.
Minn.	Chisago City.....	8 p.m., Apr. 30..	3,350 ft. concrete walks.....	J. E. Vanstrom, Village Redr.
Wash.	Olympia.....	Apr. 30..	About 60 miles of road work.....	State Highway Commission.
Ala.	Hanniston.....	Apr. 30..	Macadamizing road, cost \$9,000.....	W. F. Keller, State Highway Engr., Montgomery.
Wash.	Gray's Harbor.....	1.30 p.m., Apr. 30..	County highway construction.....	Co. Engr., Montesano.
Md.	Baltimore.....	noon, May 1..	10.57 miles concrete and sheet asphalt highway.....	State Roads Commission
W. Va.	Lewisburg.....	noon, May 1..	17.5 miles bit. macadam.....	W. E. Dougher, Engr., Roncaverte, W. Va.
Ia.	Dubuque.....	May 1..	Sageville-Dubuque road construction, brick on concrete.....	Co. Board of Supervisors.
N. Y.	Albany.....	1 p.m., May 1..	Resurfacing and reconstructing in 13 counties.....	Edwin Duffy, Highway Comr.
N. D.	Mohall.....	2 p.m., May 1..	Grading county roads.....	Peter Carlson, Co. Aud.
N. J.	Trenton.....	May 1..	Constructing sidewalks, curbs and gutters.....	Engr. of Streets.
Ind.	Evansville.....	10 a.m., Apr. 30..	County highway construction.....	C. P. Beard, Co. Aud.
Pa.	Harrisburg.....	10 a.m., May 3..	Reconstructing about 15 miles brick and concrete pavement.....	F. B. Black, State Hwy Comr.
Ga.	Barnesville.....	3 p.m., May 3..	14,000 sq. yds. brick, asphalt or concrete pavement, 8,000 ft. granite curb and 4 miles tile or concrete walk.....	Solomon-Norcross Co., Engrs., Atlanta.
W. Va.	Beckley.....	noon, May 4..	.70 miles concrete, bit. macadam or other pavement.....	C. L. Scott, Jr., Hwy. Engr.
N. J.	Essex Fells.....	8 p.m., May 4..	4,000-gallon car, 40% asphalt road oil.....	H. A. Miller, Boro Clerk.
N. Y.	Albany.....	1 p.m., May 7..	Constructing highways in 24 counties.....	Edwin Duffey, State Highway Comr.
N. J.	Newark.....	3 p.m., May 7..	Improving Franklin St., Belleville and Bloomfield; furnishing broken stone.....	F. A. Reimer, Co. Engr.
Miss.	McComb.....	10 a.m., May 7..	19.7 miles road improvement near Brookhaven.....	C. F. Sherman, Engr.
Ind.	South Bend.....	11 a.m., May 7..	Constructing cement road.....	A. F. Wolf, Co. Audr.
Ind.	Nashville.....	1 p.m., May 7..	Stone or gravel road.....	Omer Morrison, Co. Audr.
Ind.	Spencer.....	1 p.m., May 7..	Crushed stone road.....	S. M. Royer, Co. Audr.
Ind.	Franklin.....	2 p.m., May 7..	6,260 feet of gravel road.....	J. C. Gregg, Co. Audr.
Ind.	New Albany.....	10 a.m., May 7..	Township road.....	Emile Dupaquier, Co. Aud.
Ind.	Rushville.....	2 p.m., May 7..	7,138 feet concrete road, cost \$51,685; 13,000 feet Glutrin macadam road, cost \$20,000.....	W. H. McMillin, Co. Aud.
W. Va.	Fayetteville.....	2 p.m., May 7..	14.5 miles bit. macadam, concrete or asphalt concrete roads.....	T. F. Maloy, Engr., Landisburg
Pa.	Athens.....	5 p.m., May 7..	4,700 sq. yds. concrete pavement and 1,000 cu. yds. excavation.....	C. W. Tidd, Boro Clerk.
Ind.	Versailles.....	1 p.m., May 7..	Crushed stone road.....	J. F. Lochard, Co. Aud.
Ind.	Vernon.....	11 a.m., May 7..	Stone road construction.....	G. J. Bernhardt, Co. Aud.
Ind.	Brownstown.....	1 p.m., May 7..	Tarvia-macadam and gravel roads.....	Albert Leudtke, Co. Aud.
Ind.	Jeffersonville.....	10 a.m., May 7..	Limestone macadam road.....	G. W. Stoner, Co. Aud.
Miss.	Hattiesburg.....	May 7..	Constructing 50 miles of gravel road.....	R. M. Hendricks, Pres. Co. Supervisors.
Ind.	Rockport.....	2 p.m., May 7..	Gravel or stone road.....	J. Frank Stocking, Co. Aud.
Ind.	Portland.....	10 a.m., May 7..	Constructing gravel road.....	John Bonifas, Co. Aud.
Ind.	Williamsport.....	9 a.m., May 7..	5,000 ft. of gravel road.....	D. H. Moffitt, Co. Aud.
Ind.	Kokomo.....	10 a.m., May 8..	Two miles of gravel road.....	W. L. Benson, Co. Aud.
Ind.	Rochester.....	2 p.m., May 8..	Constructing stone road.....	E. A. Smith, Co. Aud.
Ind.	Monticello.....	10 a.m., May 8..	Macadam roads.....	A. G. Fisher, Co. Aud.
Ind.	Rensselaer.....	2 p.m., May 8..	Two stone roads.....	J. P. Hammond, Co. Aud.
N. D.	Antelope.....	2 p.m., May 8..	Ten miles road construction.....	John McDougal, Clerk.
Ind.	Brazil.....	10.30 a.m., May 8..	Stone and gravel road.....	W. O. Graesser, Co. Audr.
Ind.	Bloomfield.....	2 p.m., May 8..	2 macadam roads.....	G. E. Kidd, Co. Aud.
Ind.	Princeton.....	11 a.m., May 8..	Constructing stone roads.....	J. H. Armstrong, Co. Aud.
N. C.	Roxboro.....	May 8..	Sand-clay road.....	M. R. Long, Co. Highway Commr.
S. C.	Pickens.....	May 8..	Sand-clay road.....	Co. Highway Commr.
Ind.	Wabash.....	10 a.m., May 8..	1 stone and 2 gravel roads.....	F. P. Kircher, Co. Aud.
Ind.	Peru.....	Noon, May 8..	Macadam road.....	F. K. McElheny, Co. Aud.
Ind.	Danville.....	10 a.m., May 8..	Constructing three roads.....	C. M. Havens, Co. Audr.
Ind.	Salem.....	May 8..	11,735 feet road construction.....	E. E. Batt, Co. Audr.
Ind.	Crawfordsville.....	10 a.m., May 8..	Limestone and gravel roads.....	Dr. W. F. Batman, Co. Audr.
Wash.	Mt. Vernon.....	1 p.m., May 8..	Concrete road construction.....	Co. Engr.
Ind.	Delphi.....	10 a.m., May 11..	Cement construction and curbing.....	H. D. Good, Co. Aud.
Pa.	Oil City.....	4.30 p.m., May 14..	3,350 sq. yds. brick or concrete paving.....	B. B. Weber, City Engr.
O.	Kent.....	Noon, May 21..	9,000 sq. yds. first class pavement, probably Topeka 8,000 ft. of curb, 10,000 sq. feet cement or asphalt sidewalk and 5,000 cu. yds. excavation.....	E. S. Royer, City Engr
SEWERAGE.				
Minn.	Ada.....	Apr. 20..	Imhoff tanks and filter beds, cost \$25,000.....	L. P. Wolff, Engr., Germania Life Bldg., St. Paul
Minn.	Windom.....	1 p.m., Apr. 20..	Tile drains; cost, \$151,880.....	S. A. Brown, Co. Aud.
Kan.	Rosedale.....	Apr. 20..	1,200 ft. of outlet sewer, tunnel and diverting ditch; cost \$500,000.....	Harrington, Howard & Ash, Orear-Leslie Bldg., Kansas City, Mo.
N. C.	Beaufort.....	4 p.m., Apr. 20..	Five miles of sewer with electric pumping station.....	G. C. White, Engr., Durham
Pa.	Baldwin Twp.....	8 p.m., Apr. 20..	Constructing sanitary sewers.....	T. J. McGovern, Engr., Bauer Bldg., Knoxville Boro, Pa.
Wash.	Spokane.....	Apr. 20..	1,500 ft. sewer, manholes, etc.....	C. T. Bogart, Pur. Agt.
D. C.	Washington.....	2 p.m., Apr. 21..	Constructing 2,900 feet 4-foot masonry sewers.....	Chief Clerk, Engineer Dept., District Bldg.
N. J.	Glen Ridge.....	8 p.m., Apr. 23..	8-inch pipe sewer construction.....	John A. Brown, Boro Clerk.
Minn.	Winona.....	Apr. 23..	1,700 ft. 60 and 72-in. storm sewers.....	G. W. Hoffmann, City Redr.
Ia.	Bedford.....	Noon, Apr. 23..	2,568 feet 12-inch sewer, Imhoff tank and sludge bed.....	T. S. De Lay, Engr., Creston.
Pa.	Hanover.....	Apr. 23..	Imhoff tank, sludge bed, pumping station, etc.....	Clyde Potts, Engr., 30 Church St., New York City
Ont.	North Bay.....	Noon, Apr. 23..	Constructing 3 sewers.....	H. J. McAulan, Town Engr.
Kans.	Geuda Springs.....	8 p.m., Apr. 23..	9,000 feet 8 and 10-inch sewer and water main.....	Benham Engrs. Co., Colcord Bldg., Oklahoma City, Okla.
Wash.	Sedro-Woolley.....	6 p.m., Apr. 23..	Sewers in four blocks.....	C. S. Smith, City Clerk.
Ore.	Astoria.....	2 p.m., Apr. 24..	6,000 ft. 6 to 18-in. sewers.....	G. T. McLean, City Engr.
O.	Mansfield.....	Noon, Apr. 24..	10-inch sanitary sewer.....	Board of Control.
Ind.	Evansville.....	9 a.m., Apr. 24..	Sewer construction.....	Board of Public Works.
Ind.	South Bend.....	10 a.m., Apr. 24..	Pipe sewers in two streets.....	Board of Public Works.
Va.	Franklin.....	Apr. 24..	3,500 ft. sanitary sewers.....	Anderson & Christie, Engrs., Charlotte, N. C.
O.	Barberton.....	Apr. 24..	Three miles 12 to 36-in. sewers, centrifugal pump and ejectors.....	R. Winthrop Pratt, Engr., Hippodrome Bldg., Cleveland
Pa.	Johnsonburg.....	8 p.m., Apr. 25..	7,500 feet 8-inch sewers.....	Boro Engr.
Pa.	West Chester.....	Apr. 25..	Sewers and pumping plant, cost \$15,000.....	N. R. Rambo, Co. Surveyor
O.	Lakewood.....	Noon, Apr. 25..	1,500 ft. 24 to 36-in. outfall sewer.....	Dir. of Pub. Works.
Ia.	Winterset.....	Noon, Apr. 25..	3 miles tile drain.....	C. G. Norman, Co. Aud.
O.	Cleveland.....	Noon, Apr. 26..	Sewers in several streets.....	Comr. of Engineering.
N. Y.	New York.....	10.30 a.m., Apr. 26..	Sewers in the Bronx, 12-in. to 63-in.....	Douglas Mathewson, Borough President.
Ind.	Valparaiso.....	Apr. 27..	20,500 feet 8 to 24-inch sewers.....	Guy Stinchfield, City Engr.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Wis.	Appleton	9 a.m., Apr. 27	Sewer construction	E. L. Williams, City Clerk.
N. Y.	New York	2 p.m., Apr. 27	Altering and constructing receiving basins	M. M. Marks, Boro Pres.
Cal.	Los Angeles	2 p.m., Apr. 30	Two vertical sewage pumping units	H. J. Leland, Co. Clerk.
Ind.	Marion	2 p.m., Apr. 30	Tile drains, cost \$7,000	H. R. Churchill, Co. Aud.
Ind.	South Bend	10 a.m., May 1	Sewer in 2 streets	Board of Public Works.
Ind.	Oswego	2 p.m., May 1	3,000 feet 8-in. sewer	City Engr.
N. Y.	Olean	8 p.m., May 1	650 ft. 8-in. sewer	E. E. Allen, Supt. Streets.
O.	Cleveland Heights	May 3	Constructing tile sewers	F. A. Pease Engr'g. Co., Marshall Bldg., Cleveland.
O.	Centerburg	noon, May 4	2,400 ft. 8 and 10-in. sewers and disposal plant	Richards Engrg. Co., 37 1/2 E. Long St., Columbus
Pa.	Phoenixville	8 p.m., May 5	908 ft. 24-in. sewer	C. H. Keeley, Boro Clerk
N. Y.	White Plains	11 a.m., May 7	Constructing sewer	Co. Highway Supt.
O.	Kent	Noon, May 21	2,500 feet 8 to 15-in. storm sewer	E. S. Royer, City Engr.
India.	Calcutta	2 p.m., June 1	Storm water pumping plant	C. C. Chatterjee, Sec. Corp. of Calcutta.
WATER SUPPLY.				
N. C.	Beaufort	4 p.m., Apr. 20	Four miles water mains, reservoir, tower and tank, deep well and steam pumping station of 750-g. p. m. capacity	G. C. White, Engr., Durham
N. J.	Garfield	8 p.m., Apr. 20	Furnishing air compressors	J. A. Dwyer, Borough Clk.
Wis.	West Allis	2.30 p.m., Apr. 20	Water supply and sewer system at State Fair Park	C. P. Norgord, Comr. Agriculture or State Engineer, Madison.
Quebec	Drummondville	7 p.m., Apr. 20	Furnishing pumps and drilling artesian wells of capacity of 300,000 gallons a day	W. A. Moisan, Town Clerk.
Wash.	Spokane	Apr. 20	1,000 valve boxes and other equipment	C. T. Bogart, Pur. Agt.
Kans.	Geuda Springs	8 p.m., Apr. 23	13,500 feet c. i. mains, pumps, oil engines, well and elevated tank	Benham Engrg. Co., Colcord Bldg., Oklahoma City, Okla.
D. C.	Washington	Apr. 23	3 motor driven hydraulic pumps and 3 accumulators	Bureau of Yards & Docks, Navy Department.
La.	Rayne	6 p.m., Apr. 23	Municipal water and light plant	Harold Raymond, Engr., Interstate Bldg., New Orleans.
Minn.	Wadena	8 p.m., Apr. 23	7,300 ft. water mains, 4 and 6-in., 27 hydrants, etc.	L. P. Zimmerman, Engr.
Miss.	Brookhaven	7.30 p.m., Apr. 24	8-in. well 160 ft. deep	Chester Byrne, City Clerk
N. Y.	New York	11 a.m., Apr. 24	Motor and gearing and electrically driven pump	Board of Water Supply.
N. Y.	Sherburne	2 p.m., Apr. 24	Auxiliary water works system, pump and pipe furnished by city	C. E. Perry, Engr., 82 State St., Albany
Ont.	Ottawa	4 p.m., Apr. 24	Reinforced concrete pipe	City Engr.
O.	Mansfield	Noon, Apr. 24	10 electrical driven reciprocating and centrifugal pumps and 1 electrically driven air compressor	O. Hursh, Dir. Pub. Service.
Ind.	Michigan City	10 a.m., Apr. 24	Two electric motor-driven centrifugal pumps of 4,500 gallons per minute capacity	Alexander Sychalski, City Clerk.
N. Y.	New York	2 p.m., Apr. 25	Furnishing c. i. specials, valve boxes, valves and pig lead; laying water mains	William Williams, Commissioner Water Supply, Gas & Electricity.
Mass.	Fitchburg	2 p.m., Apr. 26	225-ft. earth dam, 30 ft. high	Guy H. Chase, Comr. Sts. & Engineering
O.	Alliance	Apr. 27	Furnishing c. i. pipe and specials	J. H. McConnell, Dir. of Pub. Service.
N. Y.	Auburn	Apr. 27	9,000,000-gallon slow sand filter	Hazen, Whipple & Fuller, Engrs., 30 E. 42d, New York
O.	Columbus	Noon, Apr. 30	25 tons c. i. valve boxes	Supt. of Waterworks.
O.	Columbus	Noon, Apr. 30	20,000,000-gallon centrifugal, low-lift, motor driven pump	G. A. Borden, Pres. Board of Purchase.
Ill.	Quincy	11 a.m., May 1	Drainage pumping plant, 54-inch and 36-inch centrifugal pumps	W. P. Bushnell, Engr.
Pa.	Monaca	May 1	Reservoir and two 1,000,000-gallon motor centrifugal pumps	Michael Baker, Boro Engr., Beaver
Wis.	Milwaukee	10.30 a.m., May 2	12,000,000-gallon pumping engine	F. G. Simmons, Comr. Public Works.
O.	Cleveland	Noon, May 4	Installing water main at swimming pool	Park Engr.
N. D.	Grand Forks	4 p.m., May 7	Constructing water main	W. H. Alexander, City Aud.
N. C.	Ft. Caswell	11 a.m., May 7	Constructing 9,520 feet submerged pipe line	Quartermaster.
MISCELLANEOUS.				
Ind.	Crown Point	1 p.m., Apr. 20	Titan tractor and tractor plow	Edward Simon, Co. Aud.
N. Y.	New York	2 p.m., Apr. 20	3,000 cu. yds. coarse aggregate for concrete	Comr. Public Works, Bureau of Highways.
S. C.	Columbia	noon, Apr. 21	Furnishing two transits, two levels, poles, tapes, rods, drawing instruments, etc.	J. R. Pennell, State Hwy. Engr.
Pa.	Lancaster	noon, Apr. 23	Grouting and coating 9,800 sq. ft. arch bridge surface	E. E. Mowrer, Co. Comptroller
Ill.	Pekin	Apr. 23	Power flusher of 650 gallons capacity	City Clerk.
Pa.	Aspinwall	8 p.m., Apr. 23	1 ton, chain drive motor truck	S. R. Chase, Boro Clerk, 230 First St.
Me.	Portland	2 p.m., Apr. 23	Furnishing Portland cement, concrete sand, stone and reinforcing steel	U. S. Engineer.
N. J.	Parkertown	Apr. 24	75,000 ft. 10 to 30-in. ditches in salt marshes	Board of Health
Ida.	Murphy	2 p.m., Apr. 24	Sinker Creek dam and canal system	State Engr., Boise, Ida.
Mass.	Beverly	7:15 p.m., Apr. 24	6-ton tandem road roller	F. B. Browning, Clerk.
D. C.	Washington	Apr. 25	Excavation at Nelson Reservoir, South Canal, Milk River project	U. S. Reclamation Service, Dept. of Interior.
Minn.	Faribault	2 p.m., Apr. 25	Drainage ditch; cost, \$5,200	F. M. Kaisersatt, Co. Aud.
D. C.	Washington	10 a.m., Apr. 25	Furnishing 750-pound to 3-ton motor truck	A. S. Burleson, Postmaster General.
Cal.	Willows	Apr. 25	5.75 miles irrigation ditch	Central Jacinto Irrigation Project.
O.	Cincinnati	Apr. 26	6,600 bbls. Portland cement	U. S. Engr. Office.
N. Y.	Tompkinsville	Apr. 26	1 motor truck	Lighthouse Inspector.
O.	Cincinnati	Noon, Apr. 27	Cleaning and painting iron bridges and railings	Albert Reinhardt, Clerk, Co. Commrs.
N. D.	Mandan	2 p.m., Apr. 27	Two 12-ft. graders, plows, Fresno scrapers, drag scrapers, etc.	Lee Nichols, Co. Aud.
La.	Spirit Lake	Noon, Apr. 28	Suction dredge or sand and gravel outfit	Furman & Lamb, Engrs.
Pa.	Braddock	4 p.m., Apr. 30	Constructing garbage furnace	Supt. Public Works
W. Va.	Wheeling	Apr. 30	Fireproof power house at Dam No. 24	U. S. Engr. Office.
O.	Cleveland	Noon, May 1	Constructing concrete chimney	Division of Light & Heat.
Tex.	Dallas	Noon, May 1	800-foot concrete conduit for steam pipes	Scott Consulting Engrg. Co., 4114 Cedar Springs Ave.
Miss.	Jackson	10 a.m., May 1	1,200-gallon motor sprinkler and flusher	A. F. Hawkins, Commr.
D. C.	Washington	2 p.m., May 10	Furnishing drag line excavators	U. S. Reclamation Service.
Mo.	St. Charles	2 p.m., May 14	Ditch excavation, culvert work, etc.	Alfred Riske, Engr., 1st Natl. Bank Bldg.

STREETS AND ROADS.

Birmingham, Ala.—Ordinance approved for improvements in Fifth Ave. South (formerly Ave. E).

Magnolia, Ark.—The residents of Ouachita, Columbia and Lafayette counties have organized for the purpose of building about 80 miles of hard surface roads, which, when built, will extend from Camden by way of Stephens, McNeil, Magnolia, Waldo, Buckner, Stamps and Lewisville to Garland City on the line between Lafayette and Miller counties. There it will connect with the Miller county highway, extending from Texarkana to Garland City. Funds have been raised and application has been made to the Highway Dept. to furnish engineers to make the survey. The road will be built under the Alexander law.

Alturas, Cal.—The Modoc County Supervisors are considering the idea of bonding the county for \$300,000 for road construction.

Auburn, Cal.—City Trustees adopted resolutions for paving the main streets.

Elk Grove, Cal.—Plans for raising a fund of several hundred thousand dollars to be used in macadamizing Main St., are being pushed forward under supervision of Burr Latta.

Fresno, Cal.—City engineer will prepare plans and specifications for a rock macadam street treatment for the paving of O street from Butler to Blackstone Aves.

Fresno, Cal.—Councilmen took final steps to pave H St. and Park Boulevard from Eldorado St. to the city limits, and a bridge over Dry Creek.

Fresno, Cal.—County supervisors petitioned by business men for the immediate improvement of the county road, and the building of new turn-outs between Shaver Lake and Cascade; also asks that the county appropriate \$6,500 to improve the road around the lake. The United States government has already appropriated this amount to pay half the expense.

Folsom City, Cal.—Construction of a concrete bridge, the building of highway and a new lighting system are some of the improvements planned.

Hollister, Cal.—City plans to pave West St. from Fourth to B St. Bids will be called.

Sacramento, Cal.—City plans to improve Marshall Way (formerly known as First Avenue) in Oak Grove in this city, curbing, grading, sewers, etc.

San Francisco, Cal.—Assemblyman Lyman Green introduced a bill for the construction of a military road and highway from Bodega Bay to the Black Point cut-off on the State Highway; provides for an appropriation of \$250,000 by the State, contingent upon the United States Government making a like appropriation and upon Sonoma county giving all rights of way for the road. It is planned to have this road swing along by way of the Lakeville grade, touching Petaluma, and thence westerly to Bodega Bay.

Selma, Cal.—City Engineer W. H. Shafer estimated cost of paving North McCall Ave. to the city limits with a 20-ft. strip of concrete paving at \$7,766 and 2nd St. to the city limits about \$9,000.

Ventura, Cal.—Messrs. T. M. Brown & Co. and Torrance, Marshall & Co., Los Angeles, Cal., jointly were the successful bidders for the \$350,000 highway bonds, J. B. McCloskey, county clerk.

Woodland, Cal.—Yolo and Lake County boosters will appear before the Senate Finance Committee and the Assembly Ways and Means Committee to urge the passage of an appropriation bill for \$101,000 to be used for a State Highway from Rumsey, Yolo County, to Lower Lake, Lake County, opening a scenic highway for automobilists.

Bridgeport, Conn.—The \$3,600,000 bond issue authorized by the legislature for 1917 will be used and divided as follows: Series (A) \$350,000, street extensions, term 25 years; (B) \$750,000, pavement, term 25 years; (C) \$550,000, sewers, term 25 years; (D) \$425,000, schools, 25 years; (E) \$200,000, parks, 25 years; (F) \$10,000, police and fire, term 20 years; (G) \$20,000, isolation hospital, term 20 years; (H) \$125,000, Clinic Bldg., term 25 years; (I) \$75,000, fire motors, term 5 years. Common council simultaneously the expenditure of \$750,000 from bond issue was authorized to pay for the paving, which will start this spring.

Jacksonville, Fla.—Committee on public work requested by residents along Post St. in Riverside to prepare esti-

mates and recommended the street paved from Margaret St. to the city limits.

Macon, Ga.—Details of the proposed \$1,000,000 bond issue for roads, schools, bridges and a court house in Bibb county were outlined by a joint meeting of the county commissioners' road board and committee from the board of education. The latter committee asks that \$300,000 of the bonds be devoted to school purposes. Probably this will be done and of the remaining \$700,000, \$500,000 will be used for roads and bridges and \$200,000 for a new court house. Road board and county commissioners have decided to start the work of paving the five leading roads entering the city immediately with concrete 20 ft. wide and from 6½ to 6 ins. in thickness.

Macon, Ga.—Road board and county comrs. receiving bids on sand, lime and cement for the paving work on the Houston Rd. One mile will be paved from the city limits at a width of 20 ft.

Macon, Ga.—Chamber of Commerce endorsed the \$1,000,000 bond issue for road improvements in Bibb County.

Idaho Falls, Ida.—A petition presented to City Council asking for paving of Water Ave.

Cheno, Ill.—City receiving bids shortly for street paving, about \$22,000.

Decatur, Ill.—City Council approved sidewalk ordinances for a stretch of 40 ft. of walk on the south side of Waggoner St. in Homestead Pl., and for a walk on the west side of Hutton St. from Waggoner St. south to the first alley.

Decatur, Ill.—The highway commissioners of Decatur township have granted a petition asking for a road south from Cantrel St. to the highway in front of the County Club property. The new highway is practically an extension of First St., recently opened from Wood St. south to Cantrel St.

Murphysboro, Ill.—For about \$140,000 city lets contract in May, brick paving. R. A. Rollo, city engr.

Rankin, Ill.—Will vote shortly on the question of issuing road improvement bonds of \$88,000.

Rock Island, Ill.—City commission adopted ordinance for brick paving on 17th St. 18th to 23d Ave.

Rock Island, Ill.—Bd. of Local Impvts. approved plans for the installation of brick paving on 24th St., from 18th to 23d Ave., to be 27 ft. wide.

Albion, Ind.—Noble county highway bonds to the amount of \$10,000 were sold to Wm H. Charney of Goshen, Ind., for \$370 premium.

Angola, Ind.—Bids received May 3, 1917, at 1 p. m., by treasurer of Steuben county, for sale \$8,700 highway improvement bonds, 4½ per cent., 15 years. Frank T. Dole, Treasurer.

Bloomington, Ind.—April 20, 1917, at 2 p. m., by Treasurer of Monroe County, for sale, \$8,500 highway improvement bonds, 4½ per cent., ten years. R. L. Walker, Treas.

Columbus, Ind.—Bids received April 21, 1917, at 2 p. m., by Treasurer of Bartholomew county, for sale, \$5,800 highway improvement bonds, 4 per cent., 10 years. Ed. Suverkrup, Treas.

Covington, Ind.—Lee Philpott, treasurer Fountain county, on April 12, sold to the Fletcher American National Bank, Indianapolis, highway improvement bonds to the amount of \$63,900.

Elkhart, Ind.—Bd. of Public Works adopted resolutions for street paving totaling \$150,000. Improvements include paving of portion of West Lexington Ave., South Sixth St., East Beardsley Ave., Elkhart Ave., Prairie St., Prairie St. from Main to Division will be paved and the remainder of the street is to be resurfaced. Bids are to be let within 10 or 15 days.

Greensburg, Ind.—Bids received May 10, 1917, at 2 p. m. by Treasurer of Decatur county for sale, \$9,000 highway improvement bonds, 4 per cent., 10 years. Albert Boling, Treas.

Greenfield, Ind.—Hancock county highway bonds to amount of \$5,000 were sold to W. T. Leamon of Greenfield, Ind.

Greensburg, Ind.—A \$15,600 issue of Decatur county road bonds went to J. F. Wild & Co., Indianapolis.

Huntington, Ind.—Bids received Apr. 27, 1917, at 1 p. m., by Treasurer of Huntington County, for sale, \$43,000 highway improvement bonds, 4 per cent., 10 years. A. H. Shaffer, Treas.

Huntington, Ind.—Board of commissioners signed bonds for the Wildermuth, Lawrence, Smith and Foulke roads.

Indianapolis, Ind.—Resolutions adopted for permanent improvement Carrollton Ave., from 42nd to 46th St. and first alley east of Oriental St. to Vermont.

Irvington, Ind.—Marion county highway improvement bonds, six issues, were sold as follows: Three issues, \$3,600, \$20,200 and \$5,000, to Bankers' Trust Co., for premiums of \$18, \$125 and \$25 respectively; J. F. Wild & Co., \$65,500, for \$229.25 premium; Miller & Co., \$23,500, for \$675 premium; Breed, Elliott & Harrison, \$15,000, for \$280 premium. All are ten-year bonds, and with exception of issues of \$23,000 and \$16,000, bear 4 per cent interest. These two issues bear 4½ per cent.

Kentland, Ind.—Bids received Apr. 24, 1917, at 2 p. m., by Treasurer of Newton County, for sale, \$5,300 highway improvement bonds, 4½ per cent, 10 years. Paul Weishaar, Treas.

Kokomo, Ind.—Bd. of Public Works considered a petition for walks in Elm, Locke, Hodgkin and Jenkins Sts.

Kokomo, Ind.—Bids received April 25, 1917, at 10 a. m., by Treas. of Howard County, for sale, \$3,600 highway improvement bonds, 4½ per cent, ten years. Ora J. Davies, Treas.

Lafayette, Ind.—A \$8,400 issue of Tippecanoe county road bonds were sold to the Farmers & Traders Bank, Lafayette.

Logansport, Ind.—Commissioners of Cass and Pulaski, in joint session, are arranging a bond issue to provide for the building of the Charles Williams road, along the county line between Boone township. The road is to be constructed under the 3-mile road law.

Madison, Ind.—Bids received April 24, 1917, at 1 p. m., by treasurer of Jefferson county, for sale \$14,090 and \$17,450 highway improvement bonds, 4½ per cent., 10 years. Robert Danner, Treasurer.

Mishawaka, Ind.—Board of public works adopted resolutions for the improvement of Fisher Court with a pavement, the style yet to be designated by the board. Engineer J. L. Stevens gave a report wherein he estimated the cost at \$1,800; also furnished estimate of the cost of installing sewers on Gernhart Ave. and State St., the former to cost \$2,000 and the latter \$1,900. Bids for these improvements will be opened on April 30.

Monticello, Ind.—The State Bank of Monticello was the successful bidder for road bonds in each of three roads sold by County Treasurer Middlestadt. The Didlake Rd. for \$34,000, and brought a premium of \$967. These bonds are sold for the improvement of the city streets of Monticello under the three mile road law.

Mount Vernon, Ind.—Two issues Posey county road bonds, \$6,540 and \$9,300, sold to the First National Bank, Mt. Vernon.

Muncie, Ind.—April 24, 1917, at 10 a. m., by treasurer of Delaware county, for sale \$6,100, \$2,560, \$44,000, \$33,200 and \$17,980 highway improvement bonds, 4½ per cent., 10 years. G. G. Williamson, Treasurer.

New Castle, Ind.—Bids received April 24, 1917, at 10 a. m., by treasurer of Henry county, for sale \$10,800 highway improvement bonds, 4 per cent., 10 years. J. R. Leakey, Treasurer.

Palmer, Ind.—Bids received April 23, 1917, at 1:30 p. m., by Trustee Winfield Twp., Lake County, for sale, \$10,000 highway improvement bonds, 5 per cent, ten years. G. F. Claussen, Trustee.

Peru, Ind.—Four issues Miami County highway bonds, a total of \$24,229, were awarded to Miller & Co., Indianapolis.

Rensselaer, Ind.—Bids received April 18, 1917, at 1 p. m., by Treasurer of Jasper County, for sale, \$4,600, \$7,000, \$6,000, \$10,000, \$2,600, \$7,000 and \$8,000 highway improvement bonds, 4½ per cent, ten years. Chas. V. May, Treas.

Rockville, Ind.—Bids received Apr. 23, 1917, at 2 p. m., by Treasurer of Parke County, for sale, \$7,900 and \$5,630 highway improvement bonds, 4 per cent, 10 years. E. S. Vickrey, Treas.

Rushville, Ind.—April 25, 1917, at 2 p. m., by treasurer of Rush county, for sale \$6,800 highway improvement bonds, 4½ per cent., 10 years. John O. Williams, Treasurer.

South Bend, Ind.—Voters decided in favor of spending approximately \$75,535 in improving Niles Rd as far as the State line. Improvement calls for a concrete roadbed with a surface 2 ins. thick of asphaltic concrete.

Sullivan, Ind.—The Sullivan State Bank of Sullivan, Ind., and Breed, Elliott & Harrison, of Indianapolis, were the successful bidders for \$86,070 Sullivan county highway bonds.

Valparaiso, Ind.—Bids received Apr. 24, 1917, at 10 a. m., by Treasurer of Porter county, for sale, \$15,500 highway im-

provement bonds, 4½ per cent, 10 years. E. J. Gardner, Treas.

Vevay, Ind.—Bids received May 1, 1917, at 1 p. m., by Treasurer of Switzerland county, for sale, \$12,000 highway improvement bonds, 4½ per cent, 10 years. J. L. Cunningham, Treas.

Winchester, Ind.—An issue of \$6,600 Randolph County highway bonds was sold to Miller & Co., Indianapolis.

Council Bluffs, Ia.—The Motor Club and Good Roads bureau of the Chamber of Commerce will ask the board of supervisors that the county undertake the work of graveled the Lincoln highway.

Council Bluffs, Ia.—Chamber of Commerce informed by Representative Grason the House passed the bill providing for the pavement of the road at the State School for the Deaf, making the provision that the work should not cost more than \$6,000 instead of the \$12,000 that had been provided by the measure as originally drawn. It is believed the sum provided by the bill as it goes to the Senate will be sufficient, or nearly so, to extend the South avenue paving along the west side of the Deaf School grounds.

Davenport, Ia.—The street committee of the city council outlined a number of streets in different parts of the city that will be brought to grade during the year. Part of the work will be done by the city, and on some of the streets where the grading is extensive bids will be called by the board of public works. The grading program will be brought before the council. Estimated cost: Belmont St. from Telegraph to Elmer, \$1,500; Pine St. from Newberry to Elmer, \$1,000; intersection Belmont and Telegraph road, \$250; Davis St. High to Lombard, \$140; Pleasant St., Mound to Belle Ave., \$1,000; South Ave., from Grand to Arlington, \$800; Scott St., 16th to Locust Sts., \$300; Carey Ave., from Locust to High, \$800; Grand Ave., Sixth to Eighth Sts., \$400; Grand Ave., Ninth to Tenth Sts., \$1,040; north side Middle road, from Ridewood to Fernwood, \$1,600; Telegraph road from Lincoln to Sharon, \$375; west side Division St., Richland to Park Lane, \$400; 16th St., Vine to Warren St., \$200; High St., Davis to Wilkes Ave., \$300; Wilkes Ave., High to Lombard Sts., \$800; total, \$10,905.

Des Moines, Ia.—Balkema bill providing for federal aid for State road building passed the House of Representatives. It accepts the government's offer of \$2,200,000 for highway improvement.

Dubuque, Ia.—Bd. of Spvrs. instructed County Auditor to advertise for bids in paving the Dubuque, Sageville and Lexington Rd. from Dubuque to Sageville.

Dubuque, Ia.—Council decided to pave Jackson St. from Tenth to Peru road.

Dubuque, Ia.—City adopted resolution for the improvement of Exchange St. from Curtis to the alley between Curtis and Dodge, with macadam.

Emporia, Kan.—Board of commissioners passed resolution to grade, drain, curb, gutter and pave the alley between Commercial St. and Mechanic St., from Seventh Ave. to Eighth Ave. E. H. Wade, City Clerk.

Independence, Kan.—Ordinance passed for grading, paving and curbing portion of Bungalow St. from the west line of Pennsylvania Ave. to the east line of 8th St. R. R. Bittmann, Mayor.

Lawrence, Kan.—Ordinance passed for the repaving of 13th St. from the east line of Rhode Island St. to the east line of Haskell Ave. either repaved, remacadamized, surfaced or resurfaced.

Topeka, Kan.—A brick road 16 ft. wide with a cement curb, concrete foundation, cost \$16,000 a mile to construct, will be built from Topeka to Lawrence, Kan.

Marion, Ky.—The question of issuing \$100,000 road bonds was defeated at recent election.

Rapids Parish, La.—The Rapids Bank of Alexandria, successful bidder for \$56,000 road district No. 12 bonds. R. H. Jackson, president board of supervisors.

Speonk, L. I.—Town Board has ordered a new highway in the county and work will begin as soon as the property can be surveyed. The highway is an important artery of travel from the railroad station and extends about a half mile, connecting with what was formerly the mail coach route through the Island.

Boston, Mass.—City Council receives from Mayor loan order of \$80,000 for improvement of Commonwealth Ave.

Homer, Mich.—Attorney J. W. Mackey of Marshall is preparing the required resolutions to be adopted by the village council of Homer calling for a special election to bond the village for \$10,000 to put in two blocks of pavement. The

plans and specifications have already been drawn by the L. A. Boulay Co. of Toledo, and accepted, and the city will superintend the work if the bond issue carries.

Lansing, Mich.—The contract for the grading of Larch St. from Ferris St. to Franklin Ave., preparatory to the laying of a brick pavement, has been awarded and the city's paving operations will be under way. A brick pavement also will be laid on Kalamazoo St. from River St. to Rosmer St. With the completion of this work, the engineer's department will start operations on the year's three biggest jobs—the paving of Pennsylvania Ave. north to Saginaw St., the repaving of Michigan Ave. from the P. M. R. R. and N. Y. C. R. R. crossing to Bingham St., and the widening and repaving of Washington Ave., from the Grand River bridge to the G. T. R. R. crossing.

Lansing, Mich.—Council instructed City Engineer Eddy to prepare plans and estimates for the repaving and widening of Washington Ave. from the bridge to the railroad crossing; cost, approximately \$24,000. The pavement will be 9 ft. on a side.

Lansing, Mich.—Council plans a bond issue for the three pieces of paving; will be submitted to the electors of the city at a special election to be held within the next few weeks. The issue will be for probably \$64,000, the estimated total cost. The paving of Pennsylvania Ave. will cost about \$30,000.

Mt. Clemens, Mich.—County road commissioners plan 42.5 miles road 9 to 16 ft. wide, slag on gravel base and gravel top. W. J. Lehner, engr.

Sault Ste. Marie, Mich.—City may improve Ashmun St. this summer with paving and sewer.

Duluth, Minn.—Council ordered 56 plank walks in outlying districts laid this year.

Duluth, Minn.—Property owners ask for the paving of the alley between 1st and 2d Sts. and between 29th Ave. east and Hawthorne Rd., and 2d St., between 30th Ave. east and Hawthorne Rd. City Clerk Borgen.

Indianola, Miss.—Road improvement bonds to the amount of \$200,000 were sold to Messrs. J. C. Mayer & Co., Cincinnati, and the Bank of Commerce & Trust Co. of Memphis. Clerk board of supervisors.

Starkville, Miss.—Street paving bonds to the amount of \$12,500 were sold to a Toledo firm. R. C. Bridge, mayor.

Chillicothe, Mo.—Council passed resolutions for repaving Webster St. from Locust to Washington St., and placing the curb on the south side of the street to the property line. City Auditor will soon advertise for bids for the work.

Chillicothe, Mo.—Council ordered sidewalk on the south side of Graves St. from Jameson to Samuel St.

Chillicothe, Mo.—City planned to pave Wise St. from Vine to Martin.

Greenville, Mo.—Kauffman - Smith-Emert Investment Co., of St. Louis, successful bidders for the \$200,000 road bonds.

St. Louis, Mo.—See "Sewerage."

West Plains, Mo.—City will be advertising for bids on about 5,000 sq. yds. of brick paving in the next ten days, with a probability of about 5,000 sq. yds. more of paving by time the above is done. J. P. Harlin, Mayor. City Water & Light Plant, W. P. Britain, Supt.

Lincoln, Neb.—Council ordered districts 353 and 354 paved. They are Calumet Court from Garfield to Stratford Ave., and Manse Court from Bradfield Drive to Van Dorn St.

Lincoln, Neb.—A sidewalk district on Sewall St. from 22nd to 23rd was created on a resolution introduced by the Mayor.

Lincoln, Neb.—Ordinance providing for the issuing of \$84,930 worth of paving bonds for twenty districts was introduced and passed.

Lincoln, Neb.—Ordinance creating a paving district on Franklin St. between Pepper Ave. and 27th St. was adopted.

Asbury Park, N. J.—City plans paving Kingsley St., cost about \$20,000. T. W. Pittenger, street commissioner.

Bogota, N. J.—Street committee was authorized to purchase 300 ft. of crosswalks to be laid this spring.

Bogota, N. J.—Council authorized the street committee to advertise for the grading and improving of Broad and Grove Sts.

Elizabeth, N. J.—Union County plans to issue \$22,200 road and bridge bonds.

Morristown, N. J.—City plans paving portion Maple Ave. with Amiesite. A. S. Pierson, city engr.

Newark, N. J.—Mayor approved ordinances for the paving of Oriental Place, from Oriental terrace to Mt. Pleasant Ave., with brick pavement on a 6-in. concrete foundation; for the paving of Oriental terrace, from Oriental place to Oriental St., with hillside brick on a 6-in. concrete foundation; for the paving of Moen place, from Harvey St. to Oriental pl. with asphalt pavement, 2-in. surface, 1½-in. binder, on a 6-in. concrete foundation. William Tries, Jr., president of the Board of St. & Water Comrs.

Passaic, N. J.—Commissioners agreed to pay cost of the laying of bituminous concrete pavement in River Drive, between the county bridge (Gregory Ave.) and the city limits.

Trenton, N. J.—City plans to pave South Broad St. from Liberty St. to Cedar Lane with sheet asphaltum on a 5-in. concrete base, with concrete gutters and concrete or bluestone curbs, and improved by the construction of parking spaces 6 ft. in width, on either side of the tracks of the Trenton & Mercer County Traction Corporation, in conformity with a plan prepared by Abram Swan, Jr., engineer of streets.

Brooklyn, N. Y.—Park Commissioner Raymond V. Ingersoll submitted to the board of estimate plans for the rebuilding of the plaza at the main entrance to Prospect Park at no cost to city except for paving. Commissioner Ingersoll has asked the board for appropriation of \$50,000 for paving the area of roadway still in existence.

Herkimer, N. Y.—Voted in favor of issuing \$8,000 street improvement bonds.

New York State.—See "Miscellaneous."

Niagara Falls, N. Y.—City Manager Carr was authorized to advertise for bids for concrete walk.

Northport, N. Y.—Voted in favor of issuing \$40,000 street paving bonds.

Salamanca, N. Y.—Voted in favor of issuing \$14,000 Main St. improvement bonds.

Syracuse, N. Y.—Ordinance introducing calling for the immediate improvement of Manlius St. from Butternut to James St., at a cost not to exceed \$1,000, to be charged to the city's share of permanent improvements. Council declared its intention to resurface North Salina St. from the Erie Canal to the Oswego Canal.

Yonkers, N. Y.—Ordinance authorizing the regulating and grading of Saw Mill River road from Ashburton Ave. to Tuckahoe road, one-half the expense to be borne by the city, adopted.

Yonkers, N. Y.—Resolution approved directing the city engineer to prepare a map and description for the laying out and opening of Garfield St., from the easterly end of Garfield St. to Phescott St.

Yonkers, N. Y.—Ordinance adopted authorizing the paving of McLean Ave. from South Broadway to Caryl Ave., the cost to be borne by the city.

Yonkers, N. Y.—Ordinance adopted designating bithulithic on the old macadam base as the paving for North Broadway from No. 919 to the north city line, and awarding the contract to Warren Bros. for \$36,853.80.

White Plains, N. Y.—Council decided to repave Main St. with asphalt laid on old concrete foundation; estimated cost, \$18,000, and to repave Mamaroneck Ave. from Martine to Old Mamaroneck road, with asphalt, estimated cost \$25,000. Public hearings to be held for both propositions April 23. Miguel L. Hauck, Comr. Public Works.

Asheville, N. C.—City receiving bids until April 25 at city hall for the purchase of \$35,000 street improvement bonds.

Biltmore, N. C.—A \$6,000 street improvement bonds will soon be placed on the market.

Jefferson, N. C.—Ashe County will vote May 8 on issuing \$200,000 road bonds.

Grand Forks, N. D.—East Grand Forks City Council presented with a petition urging that Third St., from the Great Northern to the Northern Pacific right-of-way be narrowed to 30 ft. and graded and curbed.

Akron, O.—Widening of the Cleveland road, as advocated by the Akron Automobile club, will be started at once.

Ashtabula, O.—Council petitioned for paving of Bell St.

Bryan, O.—The Inter County Highway No. 306 bonds to the amount of \$119,000 were purchased by the Ohio National Bank of Columbus. Y. C. Beucler, county auditor.

Canton, O.—Council asked for the pav-

ing of Hartford Ave. southeast between Tuscarawas St. east and the W. & L. E. R. R.

Canton, O.—Council presented with a petition for improvements of Cottage Pl. northwest between Arnold Ave. and Fulton Rd. northwest.

Cincinnati, O.—Council passed bond ordinance for \$182,000 for street and sewer improvements.

Hamilton, O.—City ordered sidewalk construction on the north side of East High St. from Lockwood Ave. east of alley, on both sides of Vanderveer Ave. from Lockwood Ave. east to alley, on both sides of Campbell Ave. from Lockwood Ave. east to alley, and on both sides of Lockwood Ave. from High St. east to Campbell Ave.; also ordered laid on Hancock Ave., south side, between Shuler and Kahn Aves.

Mansfield, O.—City will improve Foster St. from 3rd St. to 4th St. by paving with vitrified brick or block.

Marietta, O.—Council adopted resolutions to pave the alley between Fifth and Sixth Sts. from White's road to Tupper St., over block 41, and from Tupper to Montgomery Sts., over blocks 34, 27, 18 and 9, with concrete to a width of 8 ft. The estimates, prepared by Engineer Gates, places total cost at \$5,865.32. The improvement will include 2,993 sq. yds. of paving and 500 ft. of 12-inch tile sewer.

Monroe, O.—Co-operation of Local Chamber of Commerce will soon be asked by citizens of the village to have a spur of the Dixie Highway constructed. They seek to have the 3-mile stretch of road between the Hamilton-Middletown pike and the village improved with some permanent material.

Montpelier, O.—Messrs. Stacy & Braun, Toledo, successful bidders for \$22,000 street improvement bonds.

Lima, O.—City has planned to improve Metcalf St. from Hazel Ave. to Murphy St. by paving, etc. B. H. Simpson, Mayor.

Lima, O.—City has planned to improve West High St. from east side of Woodlawn Ave. to east line of Nixon Ave., by paving, etc.

Staubenville, O.—Street improvement bonds to the amount of \$11,500 were sold to Feibel-Elischak Co., Cincinnati. Charles R. Wells, city auditor.

Toledo, O.—City plans to pave Hawthorne St. from Bancroft St. to the New York Central Railway.

Toledo, O.—The county commissioners have approved the petition for the improvement of Hill Ave. westward from its intersection with the Maumee and Sylvania Rds. It is expected that water bound macadam will be used.

Toledo, O.—City council adopted ordinance for a \$60,000 bond issue for resurfacing and repairing improved streets.

Toledo, O.—The successful bidders for the following bonds: Messrs Sidney Spitzer & Co., and Stacy & Braun of Toledo, jointly, (a) main sewer Dist. No. 161, \$79,26, (d) Highway No. 89, \$15,800,000, (g) Highway No. 92, \$26,600,00, (j) Highway No. 97, \$45,600,00. To F. C. Hoehler & Co., Toledo, (b) Highway No. 83, \$11,500, (c) Highway No. 88, \$8,000, (e) Highway No. 90, \$12,100, (f) Highway No. 91, \$22,600, (h) Highway No. 94, \$55,000, (i) Highway No. 95, \$16,600, (k) Highway No. 98, \$9,100, (l) Highway No. 100, \$3,300.

Warren, O.—City considering municipal program for this year. Plans for raising several streets, building new bridges and laying several miles of new paving. A big engineering feat which will be undertaken soon is straightening the Mahoning River by the Trumbull Steel Co. and the city. The cost, based on figures of the federal government, will be more than \$100,000. Warren will pay \$25,000.

Frederick, Okla.—County plans to pave 51 blocks concrete. P. A. Little, Co. Engr.

Norman, Okla.—County election April 30 to vote on \$18,000 bonds to build roads in Little River Township.

Cloverdale, Ore.—M. Peterson, of Grand Ronde has asked for the construction of a road from Grand Ronde to Siletz Bay.

Donald, Ore.—Bids will be called for soon for grading and graveling of Von Westenhove Hill Rd. Plans on file with County Roadmaster W. J. Culver at Salem.

Eugene, Ore.—The state highway commission has authorized a survey to be made across Wheeler county from west to east, which is a continuation of the Oregon Central highway from Florence on the Pacific coast through the state.

Hillsboro, Ore.—Movement to open a new road east of Hillsboro which will

somewhat shorten the distance to Portland, has been inaugurated and preliminary surveys have been made.

Jacksonville, Ore.—Approximately \$59,000 is available for further construction work upon the Siskiyou grade, and the state highway commission recently authorized early prosecution of the work.

The Dalles, Ore.—Wasco county sold the \$260,000 road bond issue to the Lumbermen's Trust Co., of Portland. The first road contract will be let at once.

Walla, Ore.—Ordinance passed by council for the graveling of First St. from Spruce St. to the west bank of the Wallowa River to cost \$1,550. J. C. Baird, city recorder.

Erie, Pa.—Council passes ordinances paving with asphalt—28th St., Parade St. to east city line, estimated to cost \$50,600; 22nd St., Wayne St. to East Ave., \$10,240; and 16th to 17th, \$9,350; also repaving of State St. from 12th to Turnpike Sts. and 18th St., State to Liberty.

Erie, Pa.—Council passed ordinances establishing the grades of the following streets: 28th St., Ash to Wayne; Pennsylvania Ave., 30th to 32nd Sts.; 4th St., Pennsylvania Ave. to Dunn St.; 31st St., Wood road to east city line; Hess Ave., Lake road to lake front; and 3rd St., Pennsylvania to Hess Ave.

Montoursville, Pa.—Borough Council decided to vote on a bond issue for the paving of Main St.

Sayre, Pa.—See "Sewerage."

Williamsport, Pa.—City Council introduced an ordinance to issue \$60,000 bonds to be used for the purpose of repairing and resurfacing the paved streets, and construction of storm sewers. Harry S. Meyer, Superintendent of Accounts and Finance.

Warwick, R. I.—The taxpayers' special highway committee voted to expend the \$16,000 for permanent construction on the Oakland Beach road from Champion's corner to Oakland Beach railroad station, and on Pawtuxet Ave., from Elmwood Ave. to the railroad station in Norwood.

Woonsocket, R. I.—The highway committee recommended a \$6,300 appropriation for grading and curbing Olo St., and a \$1,500 appropriation for grading Meadow road, \$600 for grading Nebraska Ave., and \$2,500 for grading four streets in the Newland district.

Gaffney, S. C.—Cherokee highway commission has sold \$25,000 worth Cherokee county road bonds to run 30 years. The successful bidders were three firms, represented by C. M. Smith, of Gaffney; W. S. Glenn, of Spartanburg, and E. J. Ensign, of Raleigh, N. C.

Sumter, S. C.—Messrs. J. H. Hillsman & Co., Atlanta, and R. M. Marshall & Bro., Charleston, jointly were the successful bidders for the city's \$75,000 street improvement bonds.

Walterboro, S. C.—Colleton County voted in favor of issuing \$500,000 road bonds.

Blountville, Tenn.—Legislative authority will be asked for selling \$100,000 road bonds. The county court has approved this issue and Representative Worley will be asked to have the bill passed at once.

Dayton, Tenn.—Rhea County will vote on issuing \$100,000 road bonds.

Greeneville, Tenn.—Voted in favor of issuing \$510,000 road bonds.

Huntsville, Tenn.—The Scott county court has advertised for bids for \$300,000 road bonds.

Knoxville, Tenn.—Bids will be solicited upon the paving of Williams St. between 5th and Depot Aves.

Knoxville, Tenn.—Bids will be invited for the resurfacing and paving of Market Square and the unpaved portion of West Main Ave. adjoining the University campus.

Knoxville, Tenn.—Bids will be solicited for the resurfacing and paving of Market Union to Asylum Ave.

Amarito, Tex.—City will pave about 50 blocks with the \$50,000 bonds recently voted.

Dallas, Tex.—Commissioners granted petition for paving of Munger Ave. from Haskell to Carroll Ave.

Dallas, Tex.—City will pave Ross Ave. from Greenville to Florio.

Houston, Tex.—Harris county considering issuing \$1,000,000 bonds for improving highways.

Lexington, Tex.—Town plans an election to vote on bond issue for building good roads.

Waco, Tex.—City will hold election Mar. 7 to vote on \$50,000 bonds to improve streets and install sewers. G. B. Gunley, City Engr.

Bedford, Va.—No bids were received

April 2 for the building of macadam roads in Forest district, Bedford County, although the sum of \$90,000 has been provided by bond issue for the work. It is understood that new bids will be asked for in a short time.

Covington, Va.—The question of issuing \$150,000 street paving bonds carried. J. H. Overholt, Clk. of Council.

Roanoke, Va.—Resolutions adopted authorizing the placing of a 5-ft. granolithic sidewalk on the east side of Franklin Rd. between Woods and Maple Aves., S. W.; the opening of certain streets by the Roanoke Water Works Co. to lay water mains; the placing of boards on 5th and 10th St. bridges; the resurfacing of Park St. between Marshall and Elm Aves., and the city engineer was authorized to advertise for bids for a granolithic sidewalk between 20th and 21st Sts. on Patterson Ave. S. W., and the work from Walnut St. to a point 50 ft. south of the right of way line of the Virginian Railway on Jefferson St.

Roanoke, Va.—Resolutions were adopted authorizing the city engineer to put a macadam bottom on Stewart Ave., S. E., between 8th and 9th Sts., at an estimated cost of \$660.

Roanoke, Va.—The improvement of Franklin Turnpike is now assured. The work on the section from Roanoke and Starkey will begin at once.

Kalama, Wash.—County Engr. Fred C. Cramer is completing specifications for improvement of three miles of the Pacific Highway north and south of Castle Rock. Plan contemplates the construction of two overhead crossings over N. P. Ry. tracks, etc.

Olympia, Wash.—The state highway commission has adopted a budget of expenditure to insure completion of the Pacific highway between Chehalis and Vancouver. The outlay planned for is \$250,000.

Port Orchard, Wash.—J. M. Peterson, auditor Kitsap County, reports comrs. have set May 9 as date for hearing on proposed \$300,000 road bond issue. It is estimated the sum would build about 20 miles of concrete road and gravel about 40 miles of present dirt roads.

Seattle, Wash.—A bill will be introduced in the city council by Councilman Moore providing for the regrading of Beacon Hill at a cost of \$400,000 and the removal of about 1,500,000 cu. yds. of material. An emergency bill will appropriate \$25,000 for the immediate sluicing of 100,000 cu. yds. of material to take care of present slides.

Walla Walla, Wash.—W. R. Rehorn, city engineer, reports council has passed further improvement resolutions providing for sidewalks on south side of Main St. and the west side of Sixth St. et al. Objections will be heard April 24.

Walla Walla, Wash.—Council passed for concrete sidewalks in Watertown Addition, along notions of Ruth, McKinley, Roosevelt, McCabe, Olive, Wellington and Adler Sts. W. R. Rehorn, city engr.

Green Bay, Wis.—According to Division Highway Engr. W. M. Conway of Green Bay, \$1,000,000 will be spent this year on construction of roads in the counties under his jurisdiction—Brown, Outagamie, Winnebago, Calumet, Manitowish, Door, Kewaunee, Forest, Langlade, Oconto, Fond du Lac, Florence, Shawano and Marinette. The sum of \$200,000 will be spent for maintenance and \$200,000 on concrete bridges in the same territory.

Milwaukee, Wis.—Good roads enthusiasts in three states are seeking extension of the present Sheridan Road between Chicago and Milwaukee so that at least two and possibly three automobile boulevards, hard-surfaced and improved, would afford ready access to Wisconsin cities and through the upper Michigan peninsula, extending to Duluth and ultimately taking in the circuit the east shore of Lake Michigan. This it is pointed out would open up the lake and woods resorts of northern Wisconsin and Upper Michigan to automobile tourists from all sections of the country. Access to the system would be had from Chicago connections with the Dixie and I. M. highways.

Burlington, Ont.—Paving of section of Brant St. contemplated.

Hull, Que.—City Council contemplates construction of concrete pavement on Aylmer Rd. from Bridge St. to Front. City Engr. J. A. Laforest.

New Westminster, B. C.—The Board of Trade has endorsed a petition to the Provincial Government asking that a road be built between Ocean Park and

White Rock, a distance of 2 miles. City Clerk, W. A. Duncan.

North Vancouver, B. C.—The city council plans the grading and macadamizing of Keith road, between Bewicke Ave. and the western city limits at a cost of \$1,875. Clerk, J. G. Farmer.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contracts Awarded.)

Los Angeles, Cal.—Board of Pub. Wks. Mar. 31 let for construction of warrenite pavement on concrete base, cement curb, granite block gutter, reinforced concrete culverts, vitrified pipe sanitary sewer, vitrified pipe sanitary sewer house connections and reconstruction of concrete gutters of portions of Bronson Ave., 10th St. and Worton Ave., to *Bryant & Austin, Inc., 2 2-10 cts. per sq. ft. for grading to sub-grade; 15 3-10 cts. per sq. ft. for warrenite paving on concrete base; 35 cts. per lin. ft. for cement curb, Class A; 40 cts. per sq. ft. for granite block gutter; \$2,390 for reinforced concrete culverts, complete; \$3,480 for sanitary sewer, including 2,114 lin. ft. house connections, complete; \$569 for 29-662 lin. ft. of sanitary sewer house connections, complete; 16 cts. per sq. ft. for reconstruction of concrete gutter. Horace B. Ferris, Secy.

Sacramento, Cal.—By contract committee of the supervisors, *Clark & Henry Construction Co., for grading and paving 23 miles of county highway at \$106,260.65.

Sacramento, Cal.—The contract has been let for the building of 13 miles of concrete highway from the 12th St. road trestle at the American River known as the old Marysville road to Elk Horn along the Sacramento River. *The Natoms Consolidated has filed plans and specifications with County Recorder Charles Root and B. Ransome is to do the contracting work. All of the material is to be furnished by the Natoms people while Ransome will build the road for 16 cts. per lin. ft. The concrete is to be 5 ins. in thickness and the road 16 ft. wide with 4 ft. of sand as a runway on each side of the 16 ft. of cement surface.

Yreka, Cal.—Siskiyou county board of supervisors let *Albert Anderson & Co. of Grant's Pass for construction of 3 1/2 miles of roadway between Yreka and Scott Valley, price, including grading and culverts, is \$2,500. The road will start at the summit on the south side of Forest House Mountain.

Bridgeport, Conn.—Common Council accepted the contract of *Warren Bros. to furnish Warrenite to the city at \$1.20 a sq. yd. not including extra labor and grading. Contract provides the usual 5-year guarantee will lay and furnish bituminous binder at \$5 a cu. yd., and for labor and materials furnished in the preparation of the grade, as directed by the public works. The actual cost plus 5 per cent for profit shall be charged.

Springfield, Ill.—The following state-aid contracts were awarded by the State Highway Commission April 4, 1917: Cass Co., Sec. & Route G-7, specification D, bituminous macadam, *Interstate Paving Co., 301 Ayers N. B. Bldg., Jacksonville, Ill., \$6,590.25; McHenry County, Sec. I-3 and J-8, gravel, *Stahl & Faltz, Somonauk, Ill., \$24,240.

Bloomington, Ind.—Monroe Co. Comrs. awarded the J. B. Kerr Pike Rd. in Benton Twp. to *Blair & Kerr for \$7,734. The Dan Owens Bridge contract in Washington Twp. to the *Vincennes Bridge Co. for \$1,084.

Crown Point, Ind.—Lake County Commissioners awarded contract for construction of a gravel road in Ross Twp. to *A. L. Anchors, of Gary, Ind., for \$22,885.

Indianapolis, Ind.—Bd. of Pub. Works let the following contracts: Southern Ave., from Shelby to Boyd; cement walks, to *J. Harry Roberts, at 90 cts. per ft.; curbing, to *Harry Roberts, at 74 cts. per ft. St. Clair St., from Keystone to Temple; bituminous concrete, to *Republic Const. Co., at \$4.41 per ft.

Knox, Ind.—*F. W. Anald, Walkerton, Ind., for a road in Oregon, Starke county, on a bid of \$6,209.

Laporte, Ind.—*M. Fish and *J. Ackerman, both of Laporte, Ind., were the successful bidders for two Laporte county roads in Johnson and Pleasant townships.

Mt. Vernon, Ind.—*Edwin V. Green, of Mt. Vernon, Ind., for construction of 11,088 ft. gravel road for Posey county. Price is \$9,104.

Muncie, Ind.—For the Liberty township

road, Delaware county, to *Wm. Torrence of Muncie, Ind., for \$8,295.

Plymouth, Ind.—A gravel road on the Marshall-Fulton county line will be constructed by *Ebecker & Enyart, Fulton, Ind., on a bid of \$15,775.

Valparaiso, Ind.—Porter county comrs., the *A. C. O'Laughlin Co., for supplying the stone for gravel road repairs at its bid of \$1.14 a ton.

Oelwein, Ia.—*Dearborn Construction Co., Waterloo, at \$25,740, secured contract let by city for paving 11,000 sq. yds. on various streets.

Orange City, Ia.—Council awarded the contract for about 32,000 sq. yds. of asphalt paving to the *Bryant Asphalt Paving Co., of Waterloo, Ia., for the paving proper is \$1.75 per sq. yd. Paving will be put in from the ball grounds to the depot; will be 60 ft. wide in the business section and 30 ft. wide in the residence section.

Lake Charles, La.—Calcasieu police jury let for the construction of gravel highways: Highway 7, graveling 5 miles of the Vinton-Starks road, to *W. A. Sutton at approximately \$6,450; highway 1, graveling a mile of the main highway southwest of Vinton, to *W. McCorquodale at \$880; highway 6, placing shell on 8 1/2 miles of road from Vincent settlement to the Cameron line, near Hackberry, to *E. L. Farmer for \$9,344; Edgerly oil field road, extending 1 1/2 miles north of the station of Edgerly, placing gravel, to *E. L. Farmer for \$2,596.

Baltimore, Md.—Board awards let contract improving 16 streets in northwest and 15 in northwestern annexes to *American Paving Co., Montbello Ave. and Jenkins lane, and *Baltimore Asphalt Block & Tile Co., Monroe and Lorman St., at \$1.81 and \$1.78 per sq. yd., respectively.

Ann Arbor, Mich.—*Johnson & Steward, by commissioners of Washtenaw county, for Pontiac Rd., in Northfield and Ann Arbor townships. John J. Cox, engineer, University of Michigan.

Battle Creek, Mich.—Road Comrs. of Calhoun County to *Stoddard Construction Co. of Grand Rapids to build the 4 1/2 miles of paving this year of brick; contract price is \$135,297.70, or approximately \$14,940 a mile, when the state reward of \$7,600 a mile is figured in. The new road will be a part of the Detroit-Chicago paved-way and will be located in Marengo Twp. between Marshall and Albion. The road will be 13 ft. in width.

Plymouth, Mich.—*Barnes & O'Neill, Allegan, Mich., paving, \$9,000. Mill St. and E. Ann Arbor. Engr., J. J. Cox, University of Michigan, Ann Arbor, Mich.

Pontiac, Mich.—County road commissioners opened bids on the construction of several county trunk lines. Andrew Ver Hoef of Grand Rapids on improving 13 miles on the Elizabeth Lake road in Waterford, White Lake and Highland townships, for \$65,852.80. James Davidson, to complete the 13 miles on the Elizabeth Lake road for \$6,990 a mile. C. S. Bingham submitted three bids to construct 3 miles of gravel road on the Saginaw turnpike in Springfield township for \$6,990 a mile; 5 miles on the Goodson road in Avon for \$9,500 a mile; and three on the Lapeer road in Oxford for \$6,490 per mile. The Ver Hoef bid on the 13 miles was the only one retained by the commissioners, the rest being rejected as too high. Action on the bid retained was deferred.

Hazlet, Miss.—The Bd. of Supvs. of Copiah County let contract for working the public dirt roads in Districts 1, 2, 3 of the county to the following: District 1, *R. G. Prine, at \$28 per mile, all roads in district; *A. E. Ferguson and *W. R. Shelton, all first-class roads in district No. 3, at \$30 per mile per annum, and all second-class roads for \$25 per mile per annum; *R. W. Guess and *J. W. Guess, all roads in District No. 2, at \$24.95 per mile per annum; *N. E. Hinnington, 74 miles in northeast and northwest Districts No. 5, for \$30 per mile per annum, also 48 miles in the southern division of District No. 5 at \$3,450 per mile per annum. All the above bids were for a period of four years. Bids for working the public roads in District No. 4 were rejected, and bids will be received until 10 o'clock the first Monday in May, 1917, for a period of four years.

Natchez, Miss.—Board of supervisors awarded contracts for the clearing of obstructions from the ditches on the public roads of the county. *W. C. Johnson for the Kingston road at \$100; *T. J. Tildsley, Washington road, at \$145,

and also the Pine Ridge road at \$135; the Liberty road at \$218.75 and the Woodville road at \$148.

Lincoln, Neb.—*Burke Cochrane Construction Co., 1st Natl. Bk. Bldg., for paving district 331. Thirteenth St. from Van Dorn to High, and a portion of High St.

Lincoln, Neb.—The *Abel Construction Co. for 22nd St. from South to Lake St., for a price of \$17,634.70.

Newark, N. J.—*Standard Bitulithic Co., 31 Clinton St., Newark, paving various streets, \$54,401. Engr., Morris R. Sherred, city hall.

Ventnor City, N. J.—*Warner-Quinlan Co., 79 Wall St., New York City, paving, sheet asphalt on concrete base, Steelman Royal, City Clerk, Ventnor City.

Albany, N. Y.—Proposals were received by the State Highway Department at its office, No. 55 Lancaster St., Albany, N. Y., for the repair of public highways by State Aid on the 9th day of April, 1917, for: Rep. Con. No. 1012, Road No. 41, Albany County—The Sewage District & Water Plant Co., Schenectady, N. Y., \$13,887; the Belmar Contracting Co., Troy, N. Y., \$14,690.10. Rep. Con. No. 1028, Roads Nos. 28, 357, 725, 1310, 5218, 1205 and 1210, Chemung and Yates Counties—Atlantic Refining Co., Philadelphia, Pa., \$10,331.37. Rep. Con. No. 1024, Road No. 64, Chenango County—Thomas D. Carter, Norwich, N. Y., \$20,153; Nathan E. Young, Jeffersonville, N. Y., \$20,923.10; Paddelford & King, Sherburne, N. Y., \$21,014.25. Rep. Con. No. 1063, Road No. 552, Dutchess County—S. B. Van Wageningen, Inc., Rondout, N. Y., \$30,514.60. Rep. Con. No. 1046, Road No. 1074, Essex County—W. L. Lawton, Glens Falls, N. Y., \$25,955.74. Rep. Con. No. 1009, Roads Nos. 110 and 247, Fulton County—John P. Dugan & Co., Inc., Amsterdam, N. Y., \$25,908.20. Rep. Con. No. 1062, Roads Nos. 853, 1268, 5538, 714, 715, 1247, 1248, 5398, 1284, 854 and 5410, Genesee, Livingston, Monroe and Wyoming Counties—Sweeney & Boland, Rochester, N. Y., \$13,870.45; Jesse J. Crouch, Rochester, N. Y., \$14,376.35; Ribstein-Holter Co., Inc., Rochester, N. Y., \$14,494.30. Rep. Con. No. 1026, Roads No. 5327 and 5332, Lewis County—Pathfinder Cons. Co., Inc., Fulton, N. Y., \$7,172.45; Richard Hopkins, Troy, N. Y., \$8,186.90. Rep. Con. No. 1048, Road No. 5302, Livingston County—Harry W. Roberts Co., Utica, N. Y., \$23,119; Whitmore-Rauber & Vicinus, Inc., Rochester, N. Y., \$27,138. Rep. Con. No. 1007, Road No. 304, Montgomery County—John P. Dugan & Co., Inc., Amsterdam, N. Y., \$37,076.98; Dale Engineering Co., 249 Genesee St., Utica, N. Y., \$38,809.10. Rep. Con. No. 1072, Roads Nos. 368, 369, 559, 839, 1157, 5521, 5558, Oneida County—Paddelford & King, Sherburne, N. Y., \$15,703.95; The Defiance Corporation, Ticonderoga, N. Y., \$17,708.45. Rep. Con. No. 1029, Road Nos. 315, 677, 678, 781, 934 and 1303, Otsego County—Harris & Griffin, Norwich, N. Y., \$5,842.94; Griffin & Griffin, Norwich, N. Y., \$5,857.69; The Atlantic Refining Co., 3144 Passyunk Ave., Philadelphia, Pa., \$5,918.95. Rep. Con. No. 1036, Road No. 1070, Onondaga County—Dale Engineering Co., Utica, N. Y., \$4,171.50; Rosney Contr. Corp., 249 Genesee St., Buffalo, N. Y., \$4,431. Rep. Con. No. 1044, Road No. 390, Orleans County—No proposals received. Rep. Con. No. 1017, Road No. 536, Rensselaer County—W. L. Lawton, Glens Falls, N. Y., \$32,407; The Defiance Corporation, Ticonderoga, N. Y., \$37,559.60. Rep. Con. No. 1019, Road Nos. 1215, 1324, 5444 and 5458, Schoharie County—Harris & Griffin, Norwich, N. Y., \$10,070.85; The Atlantic Ref. Co., Philadelphia, Pa., \$10,221.95; Wm. G. Fox, Saratoga, N. Y., \$10,327.70. Rep. Con. No. 1057, Road No. 5208, Schuyler County—Holleran Bros., Elmira, N. Y., \$10,240.91; Frank F. Murray, Rochester, N. Y., \$10,511.56. Rep. Con. No. 1022, Roads Nos. 999, 1232, 5474, 5215, 5471, 72, 336, 338, 606, 5213, 5256, 5474, Schuyler, Tioga & Tompkins Counties—The Atlantic Refining Co., Philadelphia, Pa., \$18,961.57. Rep. Con. No. 1058, Road No. 231, Ulster County—DeGraft & Hogeboom, Inc., 130 Fair St., Kingston, N. Y., \$31,375.40; Samuel Beskin, Beacon, N. Y., \$31,757.08; S. R. Van Wageningen, Inc., Rondout, N. Y., \$32,374.08. Rep. Con. No. 1018, Roads Nos. 85, 720, 720-A, 1080 and 1224, Washington County—William G. Fox, Saratoga, N. Y., \$3,566.70.

Albany, N. Y.—Proposals were received by the State Highway Department at its office, No. 55 Lancaster St., Albany, N. Y., for the repair of public highways by State Aid on April 11, 1917: Rep. Con. No. 1013, Road No. 5010, Albany County—Sewage Disposal & Water Plant Co., Schenectady, N. Y., \$15,613.10. Rep. Con. No. 1042, Roads Nos. 5502, 1102, 1104,

5253-C, 5255 and 5352-A, Allegany & Steuben Counties—Kennedy Construction Co., Albany, N. Y., \$18,011.50. Rep. Con. No. 1073, Roads Nos. 730, 731, 5264, 873 and 5151, Cattaraugus and Chautauqua Counties—Richard Hopkins, Troy, N. Y., \$7,650.35. Rep. Con. No. 1032, Roads Nos. 596 and 596-A, Chenango County—Paddelford & King, Sherburne, N. Y., \$20,236; Jos. Walker, Albany, N. Y., \$20,917; Edgecomb Bros., Inc., Binghamton, N. Y., \$20,999.50. Rep. Con. No. 1023, Road No. 217, Delaware County—Edgecomb Bros., Inc., Binghamton, N. Y., \$8,278; DeGraff & Hogeboom, Inc., Kingston, N. Y., \$9,433.50; Richard Hopkins, Troy, N. Y., \$9,667. Rep. Con. No. 1065, Road No. 5367, Greene County—Catskill Cons. Co., Catskill, N. Y., \$38,938.10; Belmar Contg. Co., Troy, N. Y., \$41,500.10. Rep. Con. No. 1078, Roads Nos. 167, 294, 401, 574-A, 648, 766-767, 1283, 1290, 1337 and 1367, 710, 717, 829 and 191, Monroe, Livingston and Ontario Counties—Jesse J. Crouch, Rochester, N. Y., \$15,586.08; Dale Engineering Co., Utica, N. Y., \$16,974.30; Ribstein-Holter Co., Inc., Rochester, N. Y., \$16,997.67. Rep. Con. No. 1069, Roads Nos. 337, 1160, 1216, 1217 and 5492, Madison County—Griffin & Griffin, Norwich, N. Y., \$6,332.80; Paddelford & King, Sherburne, N. Y., \$6,337.75. Rep. Con. No. 1067, Road No. 15, Monroe County—Wm. Bailey & Co., Rochester, N. Y., \$9,853; Whitmore-Rauber & Vincius, Rochester, N. Y., \$10,824.75; Ribstein-Holter Co., Inc., Rochester, N. Y., \$10,878.65. Rep. Con. No. 1078, Roads Nos. 107, 155, 397, 511, 5124 and 5125, Montgomery County—H. A. Murphy, Albany, N. Y., \$10,448.60; John P. Dugan & Co., Inc., Amsterdam, N. Y., \$10,833.90. Rep. Con. No. 1053, Roads Nos. 547 and 5106, Nassau County—Edward Monahan, Manhattan Beach, N. Y., \$11,821.19. Rep. Con. No. 1033, Road No. 487, Onondaga County—Charles E. Haney, Camillus, N. Y., \$29,645.30; Flood & Van Wirt Co., Hudson Falls, N. Y., \$32,367.60; Guy B. Dickinson, Syracuse, N. Y., \$33,617.20. Rep. Con. No. 1085, Roads Nos. 74 and 971, Onondaga County—Harry W. Roberts Co., Utica, N. Y., \$40,883.95; Guy B. Dickinson, Syracuse, N. Y., \$42,344.15. Rep. Con. No. 1075, Roads Nos. 146, 207 and 333, Ontario County—Dale Engineering Co., Utica, N. Y., \$19,740; Frank T. Murray, Rochester, N. Y., \$20,270. Rep. Con. No. 1043, Road No. 387, Orleans County—Wing & Munger, Holley, N. Y., \$28,429; Greece Cons. Co., Rochester, N. Y., \$31,983.50. Rep. Con. No. 1059, Roads Nos. 162, 220, 316, 708 and 784, Otsego County—Dana W. Robbins, Inc., New York City, \$19,911.50; Richard Hopkins, Troy, N. Y., \$20,526.80. Rep. Con. No. 1014, Road No. 1115, Rensselaer County—Belmar Contg. Co., Inc., Troy, N. Y., \$15,460.25; Sewage Disposal & Water Plant Co., Schenectady, N. Y., \$16,319. Rep. Con. No. 1054, Roads Nos. 907 and 5351, Steuben County—Dale Engineering Co., Utica, N. Y., \$25,941.52; Frank T. Murray, Rochester, N. Y., \$28,277.15; T. H. Gill Co., Binghamton, N. Y., \$29,391.92. Rep. Con. No. 1061, Road No. 1018, Suffolk County—No proposals received. Rep. Con. No. 1052, Road No. 5173, Ulster County—Samuel Beskin, Beacon, N. Y., \$32,214.15; DeGraff & Hogeboom, Inc., Kingston, N. Y., \$36,595.18.

Albany, N. Y.—Proposals were received by the State Highway Department at its office, No. 55 Lancaster St., Albany, N. Y., for the repair of public highways by State Aid on the 13th day of April, 1917: Rep. Con. No. 1086, Roads Nos. 1174, 111, 123, 737, 882, 509, 5171 and 5087, Cayuga County—Richard Hopkins, Troy, N. Y., \$11,601. Rep. Con. No. 1027, Roads Nos. 884 and 1126, Franklin and St. Lawrence Counties—Herbert W. Pearl, Potsdam, N. Y., \$3,988.80. Rep. Con. No. 1060, Roads Nos. 797 and 998, Greene County—No proposals received. Rep. Con. No. 1068—Roads Nos. 460, 461, 463, 465, 466, 471-820, 5466, 5524, Herkimer County—No proposals received. Rep. Con. No. 1049, Road No. 482, Livingston County—Frank T. Murray, Rochester, N. Y., \$15,260; T. H. Gill Co., Binghamton, N. Y., \$15,904; Dale Engineering Co., Utica, N. Y., \$16,992. Rep. Con. No. 1076, Roads Nos. 286, 760, 1281, 386, 391, 392, 581 and 1293, Monroe & Orleans Counties—Sweeney & Boland, Rochester, N. Y., \$12,587.37; Ribstein-Holter Co., Inc., Rochester, N. Y., \$13,110.34; Dale Engineering Co., Utica, N. Y., \$13,879.45. Rep. Con. No. 1077, Roads Nos. 1187, 5522, 485, 484, 608, 636, 662, 1196 and 5511, Monroe and Ontario Counties—Jesse J. Crouch, Rochester, N. Y., \$9,544.93; Dale Engineering Co., Utica, N. Y., \$10,573.10. Rep. Con. No. 1010, Road No. 299, Montgomery County—John P. Dugan & Co., Inc., Amsterdam, N. Y., \$14,526.85. Rep. Con. No. 1031,

Road No. 219, Otsego County—Joseph Walker, Albany, \$4,260.10. Rep. Con. No. 1030, Roads Nos. 936, 5240, 5247, 5455 and 5443, Otsego and Delaware Counties—Harris & Griffin, Norwich, N. Y., \$9,439.15; Atlantic Refining Co., Philadelphia, Pa., \$9,507; Dana W. Robbins, Inc., New York City, \$10,358.10. Rep. Con. No. 1008, Road No. 478, Rensselaer County—Flood & Van Wirt Co., Hudson, N. Y., \$26,431. Rep. Con. No. 1034, Road No. 5282, Seneca County—Kennedy Cons. Co., Albany, N. Y., \$7,975. Rep. Con. No. 1080, Road No. 5211, Steuben County—Frank T. Murray, Rochester, N. Y., \$40,450.41; Dale Engineering Co., Utica, N. Y., \$42,747.30; John C. Bradley, Corning, N. Y., \$44,017.52. Rep. Con. No. 1082, Roads Nos. 906 and 5254, Steuben County—Frank T. Murray, Rochester, N. Y., \$18,927.84; Kennedy Cons. Co., Alban, N. Y., \$18,961.50; Greenfield Cons. Co., Hornell, N. Y., \$19,433.34. Rep. Con. No. 1035, Road No. 699, Sullivan County—Nathan E. Young, Jeffersonville, N. Y., \$25,783.80. Rep. Con. No. 1083, Roads Nos. 5289 and 29, Tioga and Chemung Counties—Holleran Bros., Elmira, N. Y., \$13,865.53.5; Peter F. Connolly, Elmira, N. Y., \$14,969.64. Rep. Con. No. 1051, Road No. 722, Washington County—No proposals received. Rep. Con. No. 1087, Road No. 724, Washington County—No proposals received. Rep. Con. No. 1041, Road No. 919, Wayne County—Frank T. Murray, Rochester, N. Y., \$22,218; Greece Cons. Co., Rochester, N. Y., \$23,671.50; Dale Engineering Co., Utica, N. Y., \$23,806.20. Rep. Con. No. 1055, Road No. 5323, Yates County—Frank T. Murray, Rochester, N. Y., \$11,450.53.5; Thomas T. Murray, Leroy, N. Y., \$12,112.38.5.

Bryan, O.—Kelly Construction Co., at \$113,000, for road improvement and bridges. Commissioners of Williams County, G. C. Beweler, Auditor.

Cincinnati, O.—To T. B. Van Camp, at \$7,684, for repair work in Wooster pike in Columbia township; also for the following repair work: Harrison pike, \$5,752.55; Cincinnati Ave., \$7,940.07; Reading road, \$3,832.60, and Kilby road, \$5,596.10. John Ruebel Construction Co. was the lowest bidder for the repair of Riddle road with macadam pavement.

Cincinnati, O.—Board of control awarded two street paving contracts to Henkle & Sullivan: West Sixth St. from Steiner Ave. to a point 1,000 ft. west, the improvement to be of granite, \$49,326; intersection of St. Clair, Jefferson Ave., Glendora Ave. and Diamond alley with brick, \$12,774.54.

Mansfield, O.—County commissioners opened bids for the Lexington-Fredricktown road and the Shiloh-Olivesburg road, but the contracts have not been awarded. The estimate on the Lexington-Fredricktown road which is to be a 14-ft. gravel pike, is \$12,281.80. The bid of Gandert & Son, of this city, was \$10,425 for the road and \$1,632.94 for the bridges. The estimate of the Shiloh-Olivesburg road, which is to be 14 ft. concrete, 1½ mile long, is \$30,098.77. H. Scott, of Ashland, bid \$29,108.50 for the roads and \$346.85 for the bridges. The bid of Clebill & Rhinehart was \$29,232.12 for the road and \$806.65 for the bridges.

Clatskanie, Ore.—For grading 2 miles of the Nehalem road has been let to A. L. Clark of Rainier on bid of \$19,649.

Windber, Pa.—Boro Council awarded Torquato Bros. Co. for paving Graham Ave. from 20th to 33rd St. brick on a concrete base. The contract involves 3,000 sq. yds. of paving.

Dallas, Tex.—Board of City Commissioners awarded to the Vibrolithic Construction Co. for the paving of Wood St. from Santa Fe to Akard St, cost \$4,621.04.

Everett, Wash.—City Commission to Grant & Ervig for \$27,764, paving of Wetmore Ave. from Pacific to 40th St. Hans Mumm, Jr., City Engr.

North Bend, Wash.—Allfred & James, Rochester-Washington north line extension road, at \$7,159.10.

Pasco, Wash.—Porter & Conley, Portland contractors, secured the contract for the construction of the Elgin county road in Franklin County, Wash., on their bid of \$11,000.

Seattle, Wash.—Board of Park Commissioners for paving with one-course concrete of the Lake Washington Boulevard, between Bradford St. and 56th Ave. South including the construction of bridges and culverts. R. E. Russell at \$22,000 paving, \$1.30 per sq. yd., planking \$20 per M.

Seattle, Wash.—Contract for portion of Pacific highway between Duwamish and Renton Junction was awarded by

the King county commissioners to the Washington Paving Co., at \$65,842. Concrete called for.

Wenatchee, Wash.—The county comra. let for grading, putting in culverts and making ready up to the point of surfacing a stretch of the Wenatchee-Cashmere Rd. for a mile and a quarter this side of Monitor to O'Connor & Bailey of this city for \$6,000.

Prairie du Chien, Wis.—City Council to Minor & Co., of Richmond Center, Wis., for laying the gutter and curbing on Minnesota St.

Superior, Wis.—City Commissioners to Ed Johnson & Son for paving Central Ave., at \$14,205.78 and 53rd St., at the South end, at \$12,556.65, reinforced concrete material on both highways.

Moncton, N. B.—Warren Bituminous Paving Co. of Ontario, Ltd., McKinnon Bldg., Toronto, for the construction of pavement estimated to cost \$125,000; also to the Carritte-Paterson Co. of St. John, N. B., for bituminous macadam paving on Bridge and Foundry Sts., at \$1.85 per sq. yd., amounts to about \$15,000, by city council.

Hull, Que.—The Ottawa Construction Co., Central Chambers, Ottawa, secured contract by city for the construction of pavement on Laurier Ave. Estimated cost, \$100,000.

SEWERAGE.

Jerome, Ariz., voted \$40,000 bonds for sewer system.

Bridgeport, Conn.—See "Streets and Roads."

Sacramento, Cal.—Resolution adopted for construction of an 8-inch vitrified ironstone pipe sewer in San Jose way.

New Haven, Conn.—Controller Barner has advertised for bids for the purchase of \$250,000 worth of Tomlinson Bridge bonds; \$200,000 worth of park bonds; \$11,000 worth of sewer bonds.

Miami, Fla.—Voted in favor of issuing \$75,000 sewer bonds and \$75,000 sewage disposal bonds.

Nampa, Ida.—No protests made to creating sewer district No. 21: council ordered city attorney and sewer committee to prepare ordinance and bids will be asked and work started as soon as possible. Cost will be about \$33,000.

Rock Island, Ill.—City commissioners adopted ordinance for sewer mains on 7th Ave. in the alley between 20th and 21st Sts., west to 20th St. and south to 9th Ave.

Kokomo, Ind.—Board of Works granted a petition for sewers in the Globe addition.

Mishawaka, Ind.—See "Streets and Roads."

Davenport, Ia.—City council will soon consider the following sewer work: Sharon St. addition in West Davenport, \$1,400; 16th St., from Vine to Marquette, \$800; sewer in rear of Coliseum, \$427. Total cost, \$2,627.

Sioux City, Ia.—To cost about \$20,000, city plans to install sanitary sewer system. T. H. Johnson, City Engr.

Cumberland, Md.—City council authorized commissioner of streets and public safety to build an 8-in. sewer on Woodside Ave. a distance of 250 ft., cost about \$200; 8-in. sewer on Cedar St. and Blau Ave., 540 ft. in length, cost about \$600; 8-in. sewer in alley off Oldtown Rd., 200 ft. long, cost about \$175.

Menominee, Mich.—City clerk was instructed to advertise for bids on the sewer to be constructed on Jenkins St. from Fish Court to Spencer Ave.

Sault Ste. Marie, Mich.—See "Streets and Roads."

Caledonia, Minn.—Village council plans sewerage system. J. F. Druar, Engr., 312 Commercial Bldg., St. Paul, making surveys. D. C. Merlo, Clk.

St. Paul, Minn.—Council has approved plans installing sewers in Charlton, Wyoming, Winona, Bradley and Clermont St.

Natchez, Miss.—See "Water Supply." **Chillicothe, Mo.**—Council approved plans and specifications for the extending of the Swift sewer as prepared by the city engineer.

Chillicothe, Mo.—City engineer was instructed to prepare plans and specifications for sewers in District No. 11.

St. Louis, Mo.—Public Improvements that Mayor Kiel hopes to obtain through a bond issue and hurry to completion during next term and the cost of each as estimated by city officials or engineers in co-operation with them are as follows: Conversion of River des Peres into a sewer, the construction of an industrial railroad along the north bank of the stream, and the establishment of drives

and streets in connection with Kings Highway boulevard, \$8,000,000; Building of new and reconstruction of old sewers in different parts of the city, \$1,000,000; Purchase of land for a municipal farm, \$301,000; For the acquisition of new parks and playgrounds the development of those already owned and for the erection of bath houses, locker buildings, etc., \$3,000,000; For a municipal convention hall, \$1,000,000; Construction of a southern approach to the Free bridge and the establishment of docks and terminals on the river front between Washington Ave. and Poplar St., \$2,000,000. The total cost of these several undertakings would be \$15,300,000, but this is conceded to be only an approximation.

Butte, Mont.—A. A. Dockstader, city clerk, reports the council has passed a resolution providing for the construction of a sewer in S. I. D. No. 228. Cost, \$4,140.

Camden, N. J.—City authorized construction of sewers, culverts or drains in and along Harrison Ave., from Cambridge St. to 26th St.; and 26th St. from Harrison Ave. to Hayes Ave.

Dover, N. J.—To build a sewerage system and sewerage disposal plant, cost \$200,000, the city has applied to State Board of Health for permission. E. J. Jenkins, City Engr.

Trenton, N. J.—City council passed ordinance to authorize the construction of sewer No. 675 in Laclede Ave.

Massena, N. Y.—At recent election the question of issuing \$30,000 sewer bonds carried.

New Hartford, N. Y.—Citizens voted in favor of issuing \$3,000 sewer disposal plant improvement bonds. A. D. Eldred, Village President.

Olean, N. Y.—Sewer committee reported favorably on petition to construct a sewer in Brookview Ave. from a manhole in the center of Maple St., east 175 feet and west 475 feet, and recommended that superintendent of streets advertise for bids.

Syracuse, N. Y.—City plans constructing sewer in Grand Ave. H. A. Allen, City Engr.

Utica, N. Y.—Ordinance adopted for the construction of a sewer in Kossuth Ave., from Catharine St. to Broad St.

Yonkers, N. Y.—Resolution adopted that the city engineer be directed to prepare plans and specifications for the construction of a sewer in that part of Spencer place within the city and in Leighton Ave.

Winston-Salem, N. C.—City voted \$175,000 sewer bonds.

Canton, O.—Council passed ordinance to issue \$5,100 for the 8th St. N. E. sanitary sewer and to levy assessments for this improvement.

Cincinnati, O.—See "Streets and Roads."

Hamilton, O.—City council ordered constructed a storm sewer on Belle Ave. from the end of the present sewer at the C. H. & D. Railway to the Dixie highway. Plans have been prepared.

Hamilton, O.—City council adopted ordinance to construct sanitary sewers on South 11th, 12th and 13th Sts., between Edison and Hensley Aves. Bonds will be issued to take care of the expense of doing the work.

Hamilton, O.—City council ordered plans and estimates prepared for a storm sewer east of the Miami and Erie Canal in the vicinity of High St.

Marietta, O.—The street and sewer committee was authorized to investigate a proposed improvement of paving and sewerage Lord and Market Sts. in West Marietta.

Marietta, O.—See "Streets and Roads."

Middletown, O.—The Davies Bertram Co., of Cincinnati, successful bidder for the 5 per cent. semi-annual 1 to 10 year (serial) (C) sewer assessment bonds to the amount of \$10,310.

Toledo, O.—See "Streets and Roads."

Alva, Okla.—City will shortly receive bids installing sewers in Dist. Nos. 5, 6, 7, 8 and 9.

Estacada, Ore.—The council passed an ordinance creating a new sewer district.

Salem, Ore.—City council adopted a resolution for the construction of a storm sewer at Fifth St. between D St. and Highland Ave.

Braddock, Pa.—The state department of health has approved plans for sewer extensions in city.

Erie, Pa.—Council passed a bill for a sanitary sewer in 23th St. from Brandes St. 330 feet east.

Erie, Pa.—See "Water Supply."

North Braddock, Pa.—City is contemplating sewer extensions.

Sayre, Pa.—Will soon ask for bids on laying 1,800 ft. 8-in. sewers and 2,000 ft. 6-in. house connections; also 1½ mile concrete curb and gutter and 20,000 sq. yds. concr. pavement.

Williamsport, Pa.—See "Streets and Roads."

Woonsocket, R. I.—Sewer commission requested the city council to act promptly in the matter of obtaining land for the South Main St. trunk sewer.

Austin, Tex.—City will shortly vote on \$170,000 bonds for sewerage disposal plant. M. C. Wellborn, city engr.

Dallas, Tex.—The immediate issuance of \$300,000 worth of sewer bonds voted by the city a year ago will be recommended to the board of city commissioners by Finance Commissioner Shannon.

Waco, Tex.—See "Streets and Roads."

Oscola, Wis.—See "Water Supply."

Superior, Wis.—E. B. Banks, City Engineer, estimated the cost of constructing a main sewer in the alley northeast of Itasca St. at Allouez, \$11,500. To construct a proposed complete system to East 5th St. would cost \$23,411.

Vancouver, B. C.—Vancouver and districts joint sewerage board approved plans for the proposed Beach Ave. sewer to be built by the city at a cost between \$25,000 and \$30,000. Work will proceed as soon as possible. It is probable that tenders will be called. Sewer will be a 6-ft. built-in work, running along Beach Ave. from Morton Ave. to the park, where it will be connected up with the trunk sewer.

London, Ont.—City Council considering sewer extension on Nightingale Ave. City Engineer, H. A. Brazier.

Waterloo, Ont.—The town engineer, Charles Moogh, will purchase 6 and 9-in. tile for the contemplated sewer extension, to cost \$2,500.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contracts Awarded.)

Fresno, Cal.—By city council for construction of the storm drainage system for city to *James Stanley of Oakland, *John Manning of Fresno, and *James Kennedy of Los Angeles. The aggregate of bids is \$88,750.60. This figure is considerably below the city engineer's estimate of \$97,290.07.

Los Angeles, Cal.—See "Streets and Roads."

Marengo, Ill.—*R. T. & G. O. McWilliams, 332 S. Michigan Ave., Chicago, by Coon Creek Drainage Commissioners, John De Yarnon, Frank Gooch and Albert McCue, Marengo, for open ditch work in said district.

Newton, Ia.—*Turner Co., Des Moines, at \$49,498, for laying 7 miles of sewers; *Ward & Weightman, Sioux City, at \$29,500, for two disposal plants, let by city.

Tama, Ia.—*T. Carey, 106 Weston Bldg., Clinton, at \$10,000, secured contract let by city installing sewer.

Cumberland, Md.—*Merwin McKalg, for furnishing four cars of sewer pipe.

Boston, Mass.—Mayor approved Apr. 2 a contract with *A. Baruffaldi, at \$1,463 for pipe sewers and drains in Stratton St., from Lyford to Lucerne St., Dorchester. Bids opened Mar. 23.

Boston, Mass.—Mayor approved Apr. 2 a contract with *John J. Lane at \$3,529.70 for pipe sewers and drains in Turner St. between Tarsenil and Washington Sts., Brighton. Bids opened March 26.

Boston, Mass.—*Dominick Vozzella for pipe sewers and drains in Minton St., between Amory St. and Brookside Ave., West Roxbury, at \$2,475.35. Mayor approved contract April 2. Bids opened Mar. 23.

Boston, Mass.—Mayor approved contract March 31, with *William L. Dolan at \$3,693 for pipe sewers and drains in Kenton road, between Washington St. and a point about 835 ft. southeasterly, West Roxbury. Bids for the work opened Feb. 25.

Boston, Mass.—Mayor approved April 2 for pipe sewers and drains in Washington St., Breck Ave. and Langley road, Brighton, with *John J. Lane at \$2,952.10. Bids opened Mar. 26.

Boston, Mass.—Mayor approved, April 2, contract with *James Barlett, at \$1,249, for pipe sewers and drain in Blue Hill Ave., between Deering and Goodale Rds., Dorchester. Bids for the work opened March 23.

Grand Rapids, Mich.—*J. Vander Quart, sewer, Fairbanks and Sinclair Aves. Engr., W. S. Moore, care L. O. Cutcheon, city clerk.

Duluth, Minn.—*Eklund & Carlson, construction of sanitary sewer in Oxford

St., from lot 28, block 5, Princeton Place addition, to Livingston St., on their bid of \$3,276.50.

Niagara Falls, N. Y.—City Council awarded for constructing the sewer from Royal Ave. across the lands of the Niagara Falls Power Co. to Buffalo Ave. near Iroquois St., thence along Buffalo Ave. to Iroquois St., to *Donnelly, Graham & Gibbons Co., of Cleveland, figure \$95,717.68. Sewer will be constructed of Robinson segment block.

Beehaven, N. C.—See "Water Supply."

Crestline, O.—*J. M. Bronkar, Crestline sewers, Bawer Ave. and So. Seltzer St., \$2,000. Engr., J. W. Atkinson, Galion, O. Edw. Libens, Village Clerk, Crestline.

Wellsburg, W. Va.—*B. O. Cresap, Wellsburg, at \$17,268, secured contract from city for trunk sewer.

Simcoe, Ont.—The town council let contracts for sewer extensions amounting in all to about \$16,000. The title will be supplied by the *Ontario Sewer Pipe Co., and the work done by *Harper & Co., St. Thomas.

Windsor, Ont.—*Canadian Incinerator Co., 40 Prince Arthur Ave., Toronto, by city council, for tearing down their present incinerator, and replacing same with the company's latest design of furnace, which, they claim, destroys all ordinary garbage and refuse without the use of fuel.

St. Lambert, Que.—For concrete pipe for trunk sewer to be constructed by the town council, *the Ideal Construction & General Supply Co., 211 McGill St., Montreal, City Engineer, H. G. Gibeau.

WATER SUPPLY.

Redcliffe, Alta.—The town council proposes to lay about one mile of 10-inch steel or cast iron pipe, and install extra pumping plant. Engineer, J. E. Askwith.

Berkeley, Cal.—City council does not plan \$2,000,000 bond issue for water system. A. G. Briggs, city engineer.

Washington, D. C.—Bureau of Foreign and Domestic Commerce (Dept. of Commerce).—The Government of a republic in Central America desires to purchase small plants for waterworks and electric lighting for towns of from 5,000 to 10,000 population; spiral-riveted sheet-iron pipe; and galvanized pipe and fittings. Quotations should be made f. o. b. American port. Cash will be paid. Correspondence should be in Spanish. Refer to Opportunity No. 24211.

St. Anthony, Ida.—A special election will be held April 24 to vote on the question of issuing water and electric light bonds to the amount of \$3,000.

Twin Falls, Ida.—A special election will be held on Apr. 24 to vote \$600,000 worth of bonds for the water plant. Plans have been prepared by Louis C. Kelsey.

Kendallville, Ind.—Engineer Champe, Toledo, Ohio, made a report concerning the water supply of the city to city council. Suggested installation of a concrete reservoir with a capacity of 500,000 gallons, cost \$9,000; construction of an aerator on top of the reservoir \$1,200, and if the two centrifugal motor-driven pumps were installed, which was also recommended, the cost would be \$5,000 and piping and miscellaneous expenses would amount to \$1,000. The council accepted the report and instructed him to proceed with the work.

Kokomo, Ind.—Board of works decided to install water mains in the Argo addition.

Nappanee, Ind.—Town board sold the Nappanee Utilities Co., for \$50,000, the combined electric light and water works plant of this town.

Riceville, Ia.—Voted a \$600 bond issue for a water works system.

Waverly, Ia.—Voted \$15,000 for water works improvement.

Lawrence, Kan.—The citizens' water advisory board recommended to the city commission the purchase of a forced draft device for the new water plant, at a cost of \$2,075. The purchase will be made from the Dean Forced Draft Co. of Kansas City. Device will be installed at the new pumping station and is expected to result in a saving of fuel. The city commission has not yet acted on the bid.

Plainville, Kan.—Ordinance passed for the issuance of 4.40 per cent. J. & J. water works system bonds to the amt. of \$10,000.

Annapolis, Md.—The proposed construction of a filtration plant in connection with the works of the Annapolis Water Co. is gaining very much in favor.

State health officials explain benefits to be derived therefrom.

Springfield, Mass.—City may install water meters in the sections where waste of water is greatest.

Akely, Minn.—Voted in favor of issuing \$10,000 water works bonds.

Duluth, Minn.—Second reading was given the ordinances appropriating \$1,200 for water curb boxes, \$8,000 for gas stoves, \$3,000 for electric current used in thawing pipes, \$3,500 for thawing equipment and \$2,655 for a truck for the works department.

Remer, Minn.—Citizens will vote in the near future on the question of issuing \$14,500 sewer system bonds.

Natchez, Miss.—Board of Aldermen approved proposition presented by the city waterworks comrs. asking authority to retire \$15,000 of the waterworks and sewerage bonds.

Grand Island, Neb.—The City Clerk was instructed to advertise for bids on an 18-in. pump to be installed at the corner of Clark and Front Sts., each contractor to furnish his own specifications.

Humphrey, Neb.—Will improve water service.

Pitman, N. J.—An ordinance is pending in the Borough Council which provides for the issuance of water plant purchase bonds to the amount of \$48,000.

Batavia, N. Y.—The question of issuing \$25,000 filtration plant bonds carried. J. J. Carmichael, City Clerk.

Canajoharie, N. Y.—Town has been granted permission to lay the village water pipes across the dyke and iron bridge.

Cortland, N. Y.—Henry C. Hodgkins, consulting engineer, presented report to the Water Board in regard to estimated cost of a new pumping station for city; a steam plant would cost \$33,000; an electric plant with turbine pumps, \$10,-

000; an electric plant with triplex pumps, \$17,153. The cost of operating a steam plant including the interest and depreciation would be \$6,525; that of a plant with motor-driven turbine pumps, \$6,568.72; of motor-driven triplex pump, \$6,674.50. A steam pump could be installed which is capable of pumping 4,000,000 gals. of water in 24 hours, or two electric pumps capable of pumping 2,000,000 gals. per day. One electric pump driven by a 100 h. p. motor could be installed to pump 2,000 gals. per minute in case of fire.

Johnson City, N. Y.—Will probably install a filter plant to remedy water pollution.

North Tonawanda, N. Y.—Voted in favor of issuing \$80,000 water works system improvement bonds.

Winston-Salem, N. C.—City voted \$125,000 water bonds.

Berthold, N. D.—Plans to build water system including 100,000-gal tank. T. R. Arnold, Great Falls, Mont., Engr.; \$12,000.

Akron, O.—City will be asked in May to pass a water bond issue of about \$300,000 if council agrees to a proposal to be submitted to them by the finance committee.

Canton, O.—Council passed ordinance authorizing a bond issue of \$80,000 for the installation of an air lift or other pumping system for the wells in the west creek valley.

Marietta, O.—City Council adopted ordinance authorizing the director of public service to enter into a contract for the purchase of sugar sulphate of iron for the use at the filtration plant of the city water works.

Middletown, O.—The Fifth Third National Bank of Cincinnati was the successful bidder for the following 4½% semi-annual bonds: (a) waterworks \$20,000, (b) waterworks \$15,000.

Toledo, O.—City Council adopted ordinance for a \$125,000 bond issue for waterworks extensions and improvements.

Stratford, Okla.—Voted in favor of issuing \$6,000 water and light bonds.

Downington, Pa.—The state department of health has granted permit for temporary disinfection and permanent improvement to water works.

Erie, Pa.—City Council receiving bids April 24th at 10.30 a. m. for the purchase of \$30,000 storm water sewer coupon bonds.

Providence, R. I.—City Council committee on water, comprising Councilman Thomas F. Rodgers (chairman) and the members of the Water Commission, Wm. F. Norton (chairman), have been authorized to expend \$30,000 for installing a new pumping plant at the No. 1 reservoir of the water works, and housing the same in a fireproof building.

Woonsocket, R. I.—City Council appropriated \$30,000 for purchase of new pump for water dept.

Knoxville, Tenn.—The installation of 30 fire hydrants in the newly acquired Oakwood territory was authorized.

Trezevant, Tenn.—Water works bonds to the amount of \$12,500 will be voted on in the near future.

Roanoke, Va.—See "Streets and Roads."

Othello, Wash.—City has decided to make extensive improvements to the water works system consisting of new engine, extension of water mains and auxiliary tank for water plant.

Pullman, Wash.—Voted in favor of issuing not exceeding 6 per cent, 20-year sewer improvement bonds to the amount of \$4,000. Matilda F. Garmon, city clerk.

Seattle, Wash.—City passed resolution for the improvement of 41st and 42d Aves. by the construction of water mains.

TOO LATE FOR CLASSIFICATION

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREETS AND ROADS.				
Minn.	Waukega	8 p.m., Apr. 24	8,900 sq. yds. concrete pavement and 6,550 feet curb.	John Madigan, City Clerk.
Wis.	Clintonville	8 p.m., Apr. 27	Paving with brick, concrete or asphalt concrete	Street Committee.
Ky.	Hopkinsville	Noon, Apr. 26	.43 miles road work, cost \$130,000	Charles Folsom, Engr.
La.	Lake Charles	2 p.m., May 1	70,000 sq. yds. concrete road	Fred Shotts, Highway Engr.
N. J.	Maplewood	8 p.m., May 1	Concrete curb and gutter	E. R. Halsey, Engr., 164 Market St., Newark.
D. C.	Washington	2 p.m., May 1	Street grading, 26,400 cu. yds.	Chief Clerk, Engr. Dept. District Bldg.
Minn.	Glencoe	1 p.m., May 4	28,000 cu. yds. graveling, 22,000 cu. yds. grading and 6 miles of dragging	F. D. Stocking, Co. Aud.
Ind.	Hartford City	2 p.m., May 7	Road construction	J. L. McGeath, Co. Aud.
Wis.	Madison	2 p.m., May 7	Paving 7 streets	City Engr.
Ind.	Greensburg	1 p.m., May 7	Constructing roads	J. C. Barbe, Co. Aud.
Ind.	Fowler	1 p.m., May 7	4 gravel roads	Warren Mankey, Co. Aud.
Ind.	Angola	1 p.m., May 7	1 concrete and 2 stone roads	I. W. Pence, Co. Aud.
Ind.	Washington	1 p.m., May 8	2 gravel roads	J. G. Clark, Co. Aud.
Ind.	Vincennes	2 p.m., May 8	7 gravel roads	J. I. Muentzer, Co. Aud.
Ind.	Marion	2 p.m., May 8	Stone and tar binder road	Mort McRae, Co. Aud.
Ind.	Martinsville	1.30 p.m., May 8	Gravel and stone roads	Sam Watson, Co. Aud.
Wash.	Shelton	4 p.m., May 8	Highway construction, cost \$13,684	A. V. Meyer, Co. Engr.
Wis.	Madison	2 p.m., May 8	Paving 10 streets	O. S. Norsman, City Clerk.
Ind.	Bedford	1 p.m., May 8	14,300 feet gravel and macadam road	Co. Aud.
Ind.	LaFayette	10 a.m., May 9	2.52 miles gravel road	Geo. Baxter, Co. Aud.
Ind.	Columbia City	Noon, May 9	Several gravel roads	T. A. McLaughlin, Co. Aud.
Ind.	Columbus	10 a.m., May 9	Road construction	W. H. Scott, Co. Aud.
Wis.	Madison	2 p.m., May 9	Paving 20 streets	O. S. Norsman, City Clerk.
Ind.	Muncie	10 a.m., May 12	Gravel or macadam roads	F. M. Williams, Co. Aud.
Me.	Bangor	10 a.m., May 14	10,000 cu. yds. gravel; bit. macadam road	City Engr.
SEWERAGE.				
Minn.	St. Peter	2 p.m., Apr. 20	Tile drainage ditch, cost \$3,500	W. H. Holz, Co. Aud.
Mass.	Boston	Noon, Apr. 20	Pipe sewers and drains in Dorchester	E. F. Murphy, Comr. Public Works.
Minn.	Marshall	Apr. 21	Tile drainage ditch	O. S. Todnem.
Mo.	Carthage	8 p.m., Apr. 23	Constructing trunk sewers	F. B. Newton, City Engr.
N. J.	Glen Ridge	8 p.m., Apr. 23	8-inch sewer	J. A. Brown, Boro Clerk.
Pa.	Ebensburg	1 p.m., Apr. 23	Laying 6,900 feet 8 and 10-inch sewers	Evans & Evans, Engrs.
Okla.	Oklahoma City	Noon, Apr. 24	Sanitary sewers	C. F. Semmelbeck, City Clk.
Mass.	Boston	Noon, Apr. 24	Sewerage works in Dorchester	E. F. Murphy, Comr. Public Works.
Minn.	Ivanhoe	11 a.m., Apr. 30	Tile drainage ditch, cost \$41,161	J. A. Hansen, Co. Aud.
S. D.	Clear Lake	3 p.m., May 3	22,300 feet 8 to 18-inch sewer	Dakota Engrg Co., Mitchell.
WATER SUPPLY.				
Wis.	Oshkosh	2 p.m., Apr. 23	3,100 feet water main excavation	Board of Public Works.
Minn.	S. Stillwater	8 p.m., Apr. 24	Extending water system	F. J. Moyes, City Recorder.
Minn.	Ada	7 p.m., May 7	Connecting water mains for 1917	Peter Sharpe, City Clerk.
MISCELLANEOUS.				
Pa.	Harrisburg	Noon, Apr. 27	Motor police patrol	E. S. Meals, Supt. Public Affairs.
Minn.	Mora	2 p.m., Apr. 26	40-h. p. gas or kerosene tractor	A. V. Sander, Co. Aud.
Minn.	Mora	2 p.m., Apr. 27	12-foot blade road grader	A. V. Sander, Co. Aud.

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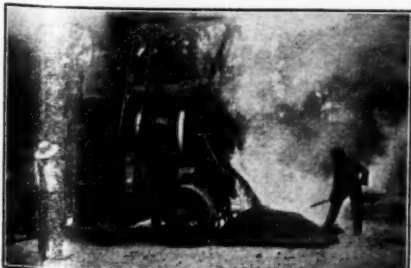
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STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912, OF MUNICIPAL JOURNAL, PUBLISHED WEEKLY AT NEW YORK, N. Y., FOR APRIL 1, 1917.

State of New York, County of New York. Before me, a Notary Public in and for the State and county aforesaid, personally appeared A. Prescott Folwell, who, having been duly sworn according to law, deposes and says that he is the editor of the Municipal Journal, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and, if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher—Municipal Journal and Engineer, 50 Union Square, New York City.
Editor—A. Prescott Folwell, Montclair, N. J.

Managing Editor—A. Prescott Folwell, Montclair, N. J.

Business Manager—J. T. Morris, White Plains, N. Y.

2. That the owners are: (Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock.)

Municipal Journal and Engineer, 50 Union Square, New York City.

Sumner W. Hume, 50 Union Square, New York City.

James T. Morris, White Plains, N. J.

A. Prescott Folwell, Montclair, N. J.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are:

Sweetland Publishing Company, 239 West 39th Street, New York City.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest, direct or indirect, in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the six months preceding the date shown above is (This information is required from daily publications only.)

A. PRESCOTT FOLWELL, Editor.

Sworn to and subscribed before me this 26th day of March, 1917.

[Seal] H. H. MINER,

Notary Public, New York Co., 176.

(My commission expires March 30, 1918.)

STREETS AND ROADS.

Wilmington, Del.—County Levy Court authorized appropriation of \$30,000 to build roads.

Danville, Ill.—City council adopted resolution instructing the superintendent of streets to replace the culvert at the intersection of Seventh and Stewart Sts.

Peoria, Ill.—Board of local improvement has determined to abandon for the present the improvement of Greenleaf St. from Jackson to Wayne, with paving. Instead, it is decided to take steps to put in a sewer.

Goshen, Ind.—Two issues of road bonds, one for \$23,400 in Elkhart township, and one for \$7,500 in Baugo township, were sold by County Treasurer W.

H. Winship to W. H. Charnley, highest bidder.

Indianapolis, Ind.—Board of public works adopted resolutions for the permanent improvement of the following streets: MacPherson St., from 28th St. to 30th St.; the second alley north of Coyner Ave., from Samoa St. to Jefferson Ave.; California St., from Washington St. to Court St.

Leominster, Mass.—City plans paving 3,000 sq. yds. on cement base, 17,000 sq. yds. heavy bituminous macadam, about \$26,000; will also spend \$42,000 for maintenance and new equipment for streets. J. W. Gates, City Engr.

Ontonagon, Mich.—\$440,000 will be spent in Baraga county on 55 miles of road in order to connect the automobile touring roads from Marquette and other southern points in Clover Land with the Copper country highways.

Minneapolis, Minn.—The "Robbinsdale to Rockford road in 1918," is the slogan of Minneapolis good roads enthusiasts since the passage by the legislature of a bill permitting a two-mill tax levy for good roads purposes. It is the first unit

in a proposed system of arterial roads for the county. County Surveyor E. E. Terrell said the bill would give the county commissioners approximately \$440,000 for road purposes, if they cared to make the 2-mill levy. This year road maintenance and the construction of the Lyndale Ave. bridge, estimated to cost \$250,000, will be the only highway undertaken by Hennepin county.

Osakis, Minn.—Village council voted to expend \$1,200 on village roads. S. J. Lyons, Village Clk.

Dayton, O.—City commission plans improving portion Illinois Ave. J. B. Harshman, Clk.

Eaton, O.—The Ohio National Bank of Columbus was the successful bidder for Barron St. improvement bonds to the amount of \$31,500. Earl Dalrymple, Village Clerk.

Logan, O.—County plans improving 6 miles roads and plans to purchase road and culvert materials. E. Shaw, County Engr.

Sidney, O.—City plans to improve portion Court and Water St. and Wapakoneta Ave. T. Blake, City Engr.

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Eugene, Ore.—The Pacific highway, from a point near Camas Swale, west of Creswell, to Cottage Grove, will be resurfaced as soon as the weather will permit. J. R. McKy, Road Supt., has charge of work.

Darlington, S. C.—The Bank of Darlington was the successful bidder for \$50,000 street improvement bonds. E. Vaughan, City Clk. and Treasurer.

Richmond, Va.—Administration board soon lets contract widening portion Hull St. and opening intersecting streets between Hull St. and Midlothian turnpike. C. E. Bolling, City Engr.

Garfield, Wash.—City plans grading principal streets and laying concrete sidewalks. About \$20,000.

Meeteetse, Wyo.—Board of Park county commissioners are about to call a special election May 15th to vote an extra two mill levy for road purposes. This will raise approximately \$16,000, and the state highway commission will appropriate a like sum, making together about \$32,000 to be used on county roads.

Hamilton, Ont.—The board of control are considering the construction of a highway to the Sanatorium. City Engineer, F. R. Gray.

St. Catharines, Ont.—City contemplates the construction of a 3-ft. sidewalk on the north side of Prospect Ave. City Engineer, W. P. Near.

St. Thomas, Ont.—City contemplates construction of cement walks. City Engineer, M. Ferguson.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contracts Awarded.)

Peoria, Ill.—*John McAllister was awarded the contract for paving South Orange St. from Main to St. James with reinforced concrete for \$3,020.45, including sandstone curbing. This is \$3.33 per front foot.

Hays, Kan.—*A. R. Young, Lawrence, Kan., at \$50,820.17, paving. W. N. Chittenden, Mayor. Engrs., E. T. Archer & Co., 514 New England Bldg., Kansas City, Mo.

Buffalo, Minn.—Wright county opened bids April 10th, grading. Bidders: J. F. Schmolet, Waverly, Minn., excavation per cu. yd., 25½ cts.; John Michaels, Buffalo, Minn., 24 and 25 cts.; C. B. Coeberin, Onoka, Minn., 28 cts.

Elizabeth, N. J.—Bids opened April 5, awarded April 12, earth fill, Baltic St., 20,000 cu. yds., *Ed. L. Faughnan, 516 Middlesex and Essex Turnpike, Elizabeth, N. J. Fill 63 cts.; total, \$12,600. Thomas E. Collins, City Engr.

Niagara Falls, N. Y.—City Manager Carr opened bids for the paving of Main St. from Montegale St. to James St., and one for the paving of an alley between Third and Fourth Sts. from Pine Ave. to Main St.

Marion, O.—*T. S. Malloy, grading and macadamizing Greenwood road, Salt Creek Twp., at \$16,726. Engr., Wm. Weston, Court House. Peal Garfield, Clerk, Marion County.

Norfolk, Va.—*Louis Lawson and F. J. McGuire, paving, curbs and gutters, Bank St., between Freemason and City Hall Ave., \$85,000; 34,000 sq. yds. asphalt and 4,670 sq. yds. wood block on concrete base, 200 lin. ft. granite curbing, 6,760 lin. ft. concrete curbing and gutter. Engr., W. H. Taylor, Armory Bldg. W. E. Stead, City Clerk, City Hall.

Everett, Wash.—The contract for the paving of Wetmore Ave. has been awarded by the city commissioners to *Grant & Ervig for \$27,764. For the repair of the 14th St. bridge was awarded to J. W. Hoover & Co., for \$1,267. Hans Mumm, Jr., City Engr.

Pineville, W. Va.—For construction of about 21 miles of earth road, contracts awarded as follows: *T. Towlers & Co., Princeton, W. Va.; *D. M. Flynn, Baileysville, W. Va.; *Vaughan & Redd, Pineville, W. Va. W. S. Coyse, Ch. Engr.

Plymouth, Wis.—City opened bids March 26th for reinforced concrete integral curb, 1.77 sq. yds. *Franx Radloff, Plymouth, Wis., paving per sq. yd., \$1.57; total, \$19,298.31.

SEWERAGE.

Cairo, Ga.—W. R. Curry of Shellman was the successful bidder for \$28,000 sewerage bonds. J. H. Connell, City Clerk.

Peoria, Ill.—See "Streets and Roads."
Indianapolis, Ind.—Board of public works adopted a resolution providing for the construction of a main sewer in



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In rural communities clusters of mail delivery boxes at the crossroads evidence Uncle Sam's postal service. Here the neighbors trudge from their homes—perhaps a few yards, perhaps a quarter mile or so—for their mail.

Comprehensive as is the government postal system, still the service rendered by its mail carriers is necessarily restricted, as the country dweller knows.

Long before rural delivery was established the Bell System began to link up the farmhouse with the neighboring towns and

villages. One-fourth of the 10,000,000 telephones in the Bell System are rural. They reach more places than there are post offices. Along the highways and private lanes the telephone poles lead straight up to the farmer's door.

He need not stir from the cheerful hearth ablaze in winter, nor grope along dark roads at night for friendly news or aid in time of trouble. Right in the heart of his home is his telephone. It is the American farmer's key to the outside world, and in no other country is it found.



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West 10th St., from Bismarck Ave. to Tibbs Ave.; cost approximately \$90,000 and will drain a large district in the northwestern part of Indianapolis.

Duluth, Minn.—Petitions for sanitary sewers were filed as follows: In Owatonna St., from Rendle St. to lot 10, block 6, Colman's addition, and from Elysian to Kolstad Ave., between Wabasha St. and Mankato alley. Both petitions were referred to the work department.

Red Wing, Minn.—May 4th was set as a date of hearing for sewer on West Sixth St., Jefferson to Harrison Sts., and on Harrison to Fifth, to connect with the proposed Main St. trunk sewer. This improvement is to cost \$3,768.

Red Wing, Minn.—Council ordered water mains on 10th St. from East Ave.

extending in a westerly direction and date of hearing on the sewer for the same district was set for May 4, to cost \$286.

St. Louis, Mo.—The Shields branch sewer was confirmed in the Alton City Court by Judge Browning of the East St. Louis City Court, when he entered an order changing the number of installments from 20 to 10. The district is the largest sewer improvement to be made in Alton. It will cost \$120,000. The first plans were made 12 years ago, and different administrations have been busied on it since the plan was first proposed. The contract has been let to the *Myers Construction Co. of St. Louis and objectors attempted to hold up the work by complaining when the installments were changed.

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Proposals for Road Oil.

SEALED PROPOSALS will be received at the City Clerk's Office, Wilkes-Barre, Pa., until Tuesday, April 24, 1917, at 12 o'clock noon, for furnishing and delivering F.O.B. cars Wilkes-Barre, Pa., 30,000 gallons of road oil, more or less. Bidders will quote prices by the barrel, tank car or otherwise, both delivered and placed on the roads, and will submit samples of the oil bid with the name or brand of oil plainly marked on each sample. Proposals to be endorsed "Proposals for Road Oil" and addressed to Fred H. Gates, City Clerk, and each bid must be accompanied by a certified bank check of the bidder in the sum of \$200.00, conditioned upon entering into a contract with the City. No action will be taken on proposals not accompanied by certified check. The City Council reserves the right to reject any or all bids.

MARTIN C. MURRAY,

Superintendent of Department of Streets and Public Improvements.

Office of the State Commission of Highways, Albany, N. Y.

Sealed proposals will be received by the undersigned at their office, No. 55 Lancaster street, Albany, N. Y., at 1 o'clock p. m. on Tuesday, the 1st day of May, 1917, for the repair of highways in the following counties:

BROOME (Two contracts—resurfacing and reconstruction).
CAYUGA (Two contracts—resurfacing and reconstruction).
CLINTON (One contract—resurfacing).
COLUMBIA (One contract—reconstruction).
ERIE (Four contracts—resurfacing—reconstruction and surface treatment).
JEFFERSON (Three contracts—resurfacing and surface treatment).
NIAGARA (Two contracts—resurfacing and reconstruction).
ORANGE (Three contracts—reconstruction and surface treatment).
OSWEGO (One contract—resurfacing).
OTSEGO (One contract—reconstruction).
SARATOGA (One contract—resurfacing).
SUFFOLK (One contract—resurfacing).
WESTCHESTER (Four contracts—surface treatment and reconstruction).

Maps, plans, specifications and estimates may be seen and proposal forms obtained at the office of the Commission in Albany, N. Y., and also at the office of the Division Engineers in whose division the roads are to be improved. The addresses of the division engineers and the counties in which they are in charge will be furnished on request.

The especial attention of bidders is called to "GENERAL INFORMATION FOR BIDDERS" in the itemized proposal, specifications and contract agreement.

I. J. MORRIS,
Secretary.

EDWIN DUFFEY,
Commissioner.

Notice to Contractors. Highway Work. State of New York.

OFFICE OF THE STATE COMMISSION OF HIGHWAYS, ALBANY, N. Y.

Sealed proposals will be received by the undersigned at their office, No. 55 Lancaster Street, Albany, N. Y., at 1 o'clock P. M. on Monday, the 7th day of May, 1917, for the construction of highways in the following counties:

ALBANY (approx. 1.45).
CATTARAUGUS (two highways—4.15 and 3.00).
CHENANGO (approx. 2.92).
CLINTON (approx. 3.34).
ERIE (three highways—4.50, 5.26 and 5.78).
ESSEX (three highways—4.95, 8.85 and 1.09).
FRANKLIN (approx. 3.53).
LEWIS (two highways—4.74 and 5.37).
MONROE (two highways—3.69 and 2.73).
MONTGOMERY (five highways—5.66, 2.70, 3.70, 3.63 and 2.74).
NIAGARA (approx. 0.61).
ONEIDA (three highways—1.05, 0.53 and 1.27).
ONONDAGA (five highways—0.96, 5.52, 7.45, 3.94 and 1.76).
ORANGE (approx. 2.48).
ROCKLAND (approx. 0.24).
SARATOGA (approx. 9.06).
SCHENECTADY (approx. 3.42).
*SCHOHARIE (approx. 7.96).
SUFFOLK (approx. 3.87).
ULSTER (approx. 1.80).
WARREN (approx. 4.59).
WASHINGTON (approx. 5.77).
WESTCHESTER (three highways—2.74, 1.09 and 1.74).
*STEBEN (approx. 5.59).

Maps, plans, specifications and estimates may be seen and proposal forms obtained at the office of the Commission in Albany, N. Y., and also at the office of the Division Engineers in whose divisions the roads are to be improved. The addresses of the division engineers and the counties in which they are in charge will be furnished on request.

The especial attention of bidders is called to "GENERAL INFORMATION OF BIDDERS" in the itemized proposal, specifications and contract agreement.

EDWIN DUFFEY, Commissioner.
I. J. MORRIS, Secretary.

Position Wanted.

An experienced water works man, eight years with private corporation, fifteen years with municipal corporation, would consider offer as superintendent or manager of water system. Fully competent to handle any department, including filters and chlorine. Can furnish good references as to ability and character. Address W. E. Waldorf, Box 476, Hornell, Steuben Co., N. Y.

PROPOSAL ADS in Municipal Journal Bring Results

Bids Asked for Athens, Pa.

Athens, Pa.
Bids will be received until 5 P. M., May 7, for 1,000 yards excavation; 4,700 square yards concrete pavement.

C. W. TIDD, Boro Clerk.

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TREASURY DEPARTMENT, Supervising Architect's Office, Washington, D. C., April 7, 1917.—Sealed proposals will be opened in this office at 3 p. m. May 21, 1917, for the construction of the United States post office at Girard, Kans. Drawings and specifications may be obtained from the custodian of the site at Girard, Kans., or at this office, in the discretion of the Supervising Architect. Drawings and specifications will be ready for delivery after April 12, 1917. Jas. A. Wetmore, Acting Supervising Architect.

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STREET PAVING. De Pere, Wisconsin.

Sealed proposals will be received by the Committee on Streets and Bridges of the City Council of the City of De Pere at the City Hall in said city, until ten (10) a. m., Friday, April 20th, 1917.

For paving having a concrete foundation on Merrill street, Lewis street, Front street, Grant street, Main avenue, North Eighth street.

Approximate quantities are as follows:
10,750 cubic yards excavation (earth).
25,314.06 square yards pavement.
15,825.91 lineal feet combined curb and gutter (concrete).

908.62 lineal feet retaining curb (stone or concrete).

Plans and specifications and forms for proposal may be obtained from the City Clerk at his office in the City Hall, De Pere, Wisconsin.

WM. H. CROSSON, City Engineer.
W. R. MATHEWS, City Clerk.

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